

The Mining Journal

RAILWAY AND COMMERCIAL GAZETTE

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

[The Mining Journal is Registered at the General Post Office as a Newspaper, and for Transmission Abroad.]

No. 2209.—VOL. XLVII.

LONDON, SATURDAY, DECEMBER 22, 1877.

[WITH SUPPLEMENT.] PRICE SIXPENCE. PER ANNUM, BY POST, £1 4s.

M. R. JAMES H. CROFTS, STOCK AND SHARE BROKER,
AND MINING SHARE DEALER.
No. 1, FINCH LANE, CORNHILL, LONDON, E.C.
ESTABLISHED 1842.

BUSINESS transacted in all descriptions of Mining Stocks and Shares (British and Foreign), Consols, Banks, Bonds (Foreign and Colonial), Railways, Miscellaneous, Insurance, Assurance, Telegraph, Shipping, Canal, Gas, Water, and Dock Shares.

BUSINESS negotiated in Stocks and Shares not having a general market value.

BUSINESS in COLLIERY and IRON Shares, and in the principal WAGON and MANUFACTURING COMPANIES of the NORTH of ENGLAND and SCOTLAND.

BUSINESS in all the principal COTTON SPINNING Shares.

Mr. J. H. CROFTS, having now established CORRESPONDING AGENCIES in all the CHIEF TOWNS of the United Kingdom, is prepared to deal in the various LOCAL Stocks and Shares at close market prices.

ACCOUNTS OPENED FOR THE FORTNIGHTLY SETTLEMENT.

A Daily Price List, issued at 5 P.M., giving latest Quotations up to close of Market. Also, on the 1st of every month a List of all Securities currently dealt in upon the Mining and Stock Exchanges, with latest prices, current dividends, and interest yielded at market price, &c., and every Friday a general List containing closing prices of the week.

MINES INSPECTED.

BANKERS: CITY BANK, LONDON; SOUTH CORNWALL BANK, ST. AUUSTELL.

SPECIAL DEALINGS in the following, or part:—

10 Aberdunant, 3s.	10 Great Laxey, £22½	100 Penruthal, 6s. 6d.
10 Bolidris, 10s.	10 Herodfoot, 2s.	100 Pasterana, 6s. 6d.
10 Bolidris, 2s. 6d.	10 Holmbush, 10s.	100 Parys Mount, 10s. 9d.
10 Chapel House, £3 1s 3d	10 Hultafall, 10s.	25 Port Phillip, 13s. 3d.
10 Chontales, 12s. 3d.	100 Javali, 7s. 6d.	50 Rookhope, 21s.
10 Combmartin, 3s.	20 Last Chance, 17s.	10 Richmond, £8½
10 Derwent, £1 17s. 6d.	15 Leadhills, £4 12s. 6d.	10 Roman Grav., £7½
10 Devon Cons., £3½	20 Llanrwst, £2 1s. 6d.	50 So. Rom. Grav., 10s.
10 East Van, £3½	20 Ladywell, 21s.	25 St. Harmon, £1½
10 Exchequer, 5s.	50 Llan Gann, £3½	20 Tankerville, £3 17s. 6d.
10 Frontino, £2 13s. 9d.	200 Malabar, 1s. 9d.	50 Van Consoles, 9s. 6d.
10 Glenroy, 20s.	15 Marke Valley, 17s.	20 W. Tankerville, 14s.
10 Goredale & Mer., £5½	10 Minera, £18	10 West Chiverton, £14
10 Grogwinion, £4½	20 N. Quebrada, £2 8s. 9d.	20 W. Wye Valley, £3½
10 Glyn, 9s. 6d.	50 North Laxey, 7s.	10 Wye Valley, £2½
10 Glenroy, 20s.	25 Pandora, 10s.	50 Yorke Peninsula, 6s. 6d.

* SHARES SOLD FOR FORWARD DELIVERY (ONE, TWO, OR THREE MONTHS) ON DEPOSIT OF TWENTY PER CENT.

BUSINESS also on hand in—Great Holway, Lisburne, New Zealand Kapanga, Punt, Lovell, St. Patrick, Santa Barbara, West Craven Moor.

DRESDY MOUNTAIN (LEAD).—BUSINESS negotiated in these Shares.

JAMES H. CROFTS, 1, FINCH LANE, LONDON.

TIN SHARES—SPECIAL BUSINESS at close prices in Carn Brea, Cook's Kitchen, Dolcoath, East Lovell, South Condurrow, Tincroft, West Agar, Favour, Grenville, Ury, Wheel Kitty, and others.

JAMES H. CROFTS, 1, FINCH LANE, LONDON.

FOREIGN BONDS—ARGENTINE—EGYPTIAN—RUSSIAN, TURKISH, SPANISH, PERU, &c.

SPECIAL BUSINESS in the above, and Fortnightly Accounts opened on receipt of the usual cover.

JAMES H. CROFTS, 1, FINCH LANE, LONDON.

RAILWAYS—HOME AND FOREIGN.

SPECIAL BUSINESS in the above, and Fortnightly Accounts opened on receipt of the usual cover.

JAMES H. CROFTS, 1, FINCH LANE, LONDON.

MISCELLANEOUS AND TRAMWAY SHARES.

SPECIAL BUSINESS in—

10 Alhambra, £2 17s. 6d.	10 Milner's Safe, 10s.
10 Brighton Aquarium, £10 17s. 6d.	50 Newcastle Chemical, 10s.
10 Charing Cross Hotel, 10s.	20 North Metropolitan Tram., £17 8s 9d
10 Derwent & Tiverton Brewery, 10s.	10 Parnson and Co., £3½
10 Fawcett Warehouse, £24½	100 Positive Life Assurance, 4s. 6d.
10 Glasgow Tramway, £11 18s. 9d.	20 Royal Aquarium, £2 2s. 6d.
10 Halcumb Sack, £3½	10 Tramways Union, £5½
10 Hudson's Bay, £10½	5 Weymouth and Channel Island, 10s.
10 Langham Hotel, 10s.	20 Yarmouth Aquarium, 10s.
10 Lives Chemical, £7 7s. 6d.	

BUSINESS TRANSACTED in all MISCELLANEOUS SHARES (of whatever description) having LONDON or COUNTRY MARKET VALUES.

JAMES H. CROFTS, 1, FINCH LANE, LONDON.

BANKERS: CITY BANK, LONDON; SOUTH CORNWALL BANK, ST. AUUSTELL.

ESTABLISHED 1842.

MR. W. H. BUMPUS, STOCK AND SHARE BROKER,
AND MINING SHARE DEALER,
44, THREADNEEDLE STREET, LONDON, E.C.
ESTABLISHED 1867.

BUSINESS transacted in MINING and COLLIERY Shares of every description, English and Foreign Stocks, Colonial Government Bonds, Railways, Banks, and Miscellaneous Shares, and all Securities dealt in on the London Stock Exchange, for INVESTMENT or SPECULATION.

Purchases and Sales negotiated in Unmarketable Stocks and Shares. Speculative Accounts opened for the Fortnightly Settlement.

References given and required when necessary.

A Stock and Share List forwarded free on application.

Mr. BUMPUS has SPECIAL BUSINESS in the undermentioned:—

10 Argentine, £2.	40 East Caradon, 17s.	60 North Laxey, 8s.
10 Ashton, 15s. 6d.	50 Exchequer, 5s. 3d.	40 Parys Mount, 10s. 6d.
10 Blue Tent, £2½	15 Frontino, £2 11s. 3d.	50 Port Phillip, 13s. 6d.
10 Birdseye, 12s.	20 Flagstaff, 18s. 6d.	15 Pateley Bridge, £3½
10 Codes of Chili, £2.	10 Goredale, £5½	25 Richmond, £8 13s. 9d.
10 Chicago, £2 8s. 3d.	70 Glenroy, 15s.	50 Rookhope, 21s.
10 Chontales, 12s. 6d.	20 Hultafall, 10s.	10 Roman Grav., £7 11s. 9d.
10 Cedar Creek, 5s. 6d.	50 I. X. L., 5s.	50 So. Rom. Grav., 10s.
10 Derwent, 10s. 3d.	40 Javali, 7s. 6d.	15 Tankerville, £3½
10 Devon Consols, £3½	25 Kapanga, 19s. 9d.	3 Van, £30½
10 Don Pedro, 7s. 9d.	30 Llanrwst, 10s.	25 W. Tankerville, 17s.
10 East Lovell, 18s.	15 Leadhills, £4½	25 Wheel Grenville, £3½
10 East Van, £3 18s. 9d.	20 Last Chance, 17s.	(call paid).
10 Eberhardt, £7 18s. 9d.	50 Marke Valley, 17s.	20 W. Godolphin, 33s.
	20 N. Quebrada, £2 8s. 9d.	

DYSONPORT and TIVERTON BREWERY COMPANY.—Mr. BUMPUS can supply a limited number of these shares on advantageous terms to cash purchasers.

The following Shares are worth Buying for a rise, viz.:—WHEAL GRENVILLE, HULTAFALL, ROOKHOPE, SOUTH FRANCES, and PARYS MOUNTAIN.

SPECIAL BUSINESS, at close prices, in the SHARES of all the principal HOME and FOREIGN MINES.

WILLIAM HENRY BUMPUS, SWORN BROKER.
Offices: 44, Threadneedle Street, London, E.C.

BANKERS—THE NATIONAL PROVINCIAL BANK OF ENGLAND, E.C.

JOHN RISLEY (SWORN), STOCK AND SHARE BROKER,
28, CORNHILL, LONDON, E.C.

MESSRS. ENDEAN AND CO., STOCK AND SHARE DEALERS,
85, GRACECHURCH STREET, LONDON, E.C.

LLANRWST LEAD MINE.

WANTED TO PURCHASE, ONE THOUSAND SHARES, or any portion of them. State number and lowest price.

OFFERS WANTED FOR—

25 East Craven Moor, 100 Medlyn Moor.	10 West Chiverton.
25 East Craven Moor, 100 Medlyn Moor.	25 Lovell.
25 East Craven Moor, 100 Medlyn Moor.	30 Brynmawr Colliery.

MANES, ENDEAN AND CO., 85, GRACECHURCH STREET, E.C.

MESSRS. PETER WATSON AND CO.,
54, OLD BROAD STREET, LONDON, E.C.
BUSINESS in STOCKS and SHARES.
RAILWAYS, BANKS, DIVIDEND LEAD MINES, &c.
BANKERS: THE ALLIANCE BANK (Limited).
A CIRCULAR published MONTHLY. Single Copy, 6d.; Annually, 5s.

M. R. ALFRED E. COOKE,
STOCK AND SHARE DEALER,
76, OLD BROAD STREET, LONDON, E.C.
ESTABLISHED 1853.

DAILY PRICE LISTS of all STOCK EXCHANGE SECURITIES and MINES ready at 5 P.M., and forwarded to applicants.

INVESTORS' GAZETTE, published every FRIDAY EVENING in time for post, sent on receipt of postage stamp.

AN INVALUABLE PUBLICATION.

CORNISH SHARES and the METAL MARKET, PARYS MOUNTAIN, ROMAN GRAVELS, HOLMBUSH, NORTH LAXEY, GROGWINION, RICHMOND, &c. Read the "INVESTORS' GAZETTE," published last evening, and EVERY FRIDAY EVENING. Post free for three months, 2s. 6d.

Edited by ALFRED E. COOKE.

COOKE'S MONTHLY INVESTMENT LIST, published on the FIRST OF EVERY MONTH, price 6d. each copy.

THE MOST NOVEL and CONVENIENT LIST EVER ISSUED.

ALFRED E. COOKE, STOCK AND SHARE DEALER,
76, OLD BROAD STREET, LONDON.
ESTABLISHED 1853.

MR. JAMES STOCKER, STOCK AND SHARE BROKER,
AND MINING SHARE DEALER,
2, CROWN COURT, THREADNEEDLE STREET, LONDON, E.C.
[Established 1848.]

BUSINESS in all kinds of STOCK EXCHANGE SECURITIES, BRITISH and FOREIGN MINING, COLLIERY, MANUFACTURING, and other SHARES.

SPECIAL BUSINESS in the following:—

RAILWAYS.—Caledonian, Metropolitan, Brighton, and Great Eastern.

FOREIGN BONDS.—Russian, Turkish, Spanish, Egyptian, and Peruvian.

TELEGRAPHS.—Anglo-American, Brazilian Submarine, Eastern, and Globe.

BRITISH and FOREIGN MINES:—

D'Ersby, 37s. 6d.
Derwent, 37s. 6d.
East Van, £3½
Grogwinion, £4½
Glenroy, 18s. 6d.
Glyn, 9s.
Goredale & Merlyn, 10s.
Holmbush, 32s. 6d.
Leadhills, £4½
Ladywell, 20s. 6d.
Llanrwst, 40s.
Marke Valley, 16s. 6d.
North Laxey, 7s.
Cambrian, Carn Brea, Devon Consols, Dolcoath, East Caradon, Lovell, Minera, Tincroft, Van, Wheel Chiverton, Wheel Kitty, Argentine, Chicago, Colorado, Don Pedro, I. X. L., Javali, Malabar, South Aurora, Yorke Peninsula.

COLLIERIES.—Alltarn, Chapel House, New Sharlston, and Thorp's Gawber.

MISCELLANEOUS.—Devonport and Tiverton Brewery, Credit Foncier, Diamond Rock, Elbow Vale, General Credit, Halcumb Sack, Hudson's Bay, National Steam, Native Guano, Tramway, and Aquarium Shares.

BANKERS: LONDON AND WESTMINSTER.

MR. T. E. W. THOMAS, SHARE BROKER,
3, GREAT WINCHESTER STREET BUILDINGS, E.C.
Established 1857.

The following are the latest prices at which business could be done. Where the difference between the buying and selling price is wide transactions may be effected at an intermediate price:—

Buyers.	Sellers.	Buyers.	Sellers.
Cambrian, 37s. 6d.	37s. 6d.	Leadhills, 10s.	10s.
Chontales, 10s.	10s.	Marke Valley, 16s.	16s.
D'Ersby, 37s. 6d.	37s. 6d.	North Laxey, 7s.	7s.
Derwent, 37s. 6d.	37s. 6d.	New Quebrada, 2½	2½
East Van, £3½	£3½	New Zealand Kapanga, 9s.	9s.
Grogwinion, £4½	£4½	Parys Mount, 10s. 6d.	10s. 6d.
Glenroy, 18s. 6d.	18s. 6d.	Pateley Bridge, 13s.	13s.
Glyn, 9s.	9s.	Richmond, 8½	8½
Goredale & Merlyn, 10s.	10s.	Roman Gravels, 7½	7½
Holmbush, 32s. 6d.	32s. 6d.	Rookhope, 21s.	21s.
Leadhills, £4½	£4½	South Condurrow, 9½	9½
Ladywell, 20s. 6d.	20s. 6d.	Tankerville, 4s.	4s.
Llanrwst, 40s.	40s.	Tincroft, 15s.	15s.
Marke Valley, 16s. 6d.	16s. 6d.	West Chiverton, 13s.	13s.
North Laxey, 7s.	7s.	West Pateley Bridge, 13½	13½
Cambrian, Carn Brea, Devon Consols, Dolcoath, East Caradon, Lovell, Minera, Tincroft, Van, Wheel Chiverton, Wheel Kitty, Argentine, Chicago, Colorado, Don Pedro, I. X. L., Javali, Malabar, South Aurora, Yorke Peninsula.		West Godolphin, 15½	15½
COLLIERIES.—Alltarn, Chapel House, New Sharlston, and Thorp's Gawber.		West Tankerville, 15s.	15s.
MISCELLANEOUS.—Devonport and Tiverton Brewery, Credit Foncier, Diamond Rock, Elbow Vale, General Credit, Halcumb Sack, Hudson's Bay, National Steam, Native Guano, Tramway, and Aquarium Shares.		West Wye Valley, 3½	3½
BANKERS: LONDON AND WESTMINSTER.		W. Grenville, 2½	2½
		W. Tankerville, 17s.	17s.
		W. Wye Valley, £3½	£3½
		W. Wheel Grenville, £3½	£3½
		W. York Peninsula, 6s.	6s.

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Chontales, 10s.	10s.	Marke Valley, 16s.	16s.
D'Ersby, 37s. 6d.	37s. 6d.	North Laxey, 7s.	7s.
Derwent, 37s. 6d.	37s. 6d.	New Quebrada, 2½	2½
East Van, £3½	£3½	New Zealand Kapanga, 9s.	9s.
Grogwinion, £4½	£4½	Parys Mount, 10s. 6d.	10s. 6d.
Glenroy, 18s. 6d.	18s. 6d.	Pateley Bridge, 13s.	13s.
Glyn, 9s.	9s.	Richmond, 8½	8½
Goredale & Merlyn, 10s.	10s.	Roman Gravels, 7½	7½
Holmbush, 32s. 6d.	32s. 6d.	Rookhope, 21s.	21s.
Leadhills, £4½	£4½	South Condurrow, 9½	9½
Ladywell, 20s. 6d.	20s. 6d.	Tankerville, 4s.	4s.
Llanrwst, 40s.	40s.	Tincroft, 15s.	15s.
Marke Valley, 16s. 6d.	16s. 6d.	West Chiverton, 13s.	13s.
North Laxey, 7s.	7s.	West Pateley Bridge, 13½	13½
Cambrian, Carn Brea, Devon Consols, Dolcoath, East Caradon, Lovell, Minera, Tincroft, Van, Wheel Chiverton, Wheel Kitty, Argentine, Chicago, Colorado, Don Pedro, I. X. L., Javali, Malabar, South Aurora, Yorke Peninsula.		West Godolphin, 15½	15½
COLLIERIES.—Alltarn, Chapel House, New Sharlston, and Thorp's Gawber.		West Tankerville, 15s.	15s.
MISCELLANEOUS.—Devonport and Tiverton Brewery, Credit Foncier, Diamond Rock, Elbow Vale, General Credit, Halcumb Sack, Hudson's Bay, National Steam, Native Guano, Tramway, and Aquarium Shares.		West Wye Valley, 3½	3½
BANKERS: LONDON AND WESTMINSTER.		W. Grenville, 2½	2½
		W. Tankerville, 17s.	17s.
		W. Wye Valley, £3½	£3½
		W. Wheel Grenville, £3½	£3½
		W. York Peninsula, 6s.	6s.

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Derwent, 37s. 6d.	37s. 6d.	New Quebrada, 2½	2½
East Van, £3½	£3½	New Zealand Kapanga, 9s.	9s.
Grogwinion, £4½	£4½	Parys Mount, 10s. 6d.	10s. 6d.
Glenroy, 18s. 6d.	18s. 6d.	Pateley Bridge, 13s.	13s.
Glyn, 9s.	9s.	Richmond, 8½	8½
Goredale & Merlyn, 10s.	10s.	Roman Gravels, 7½	7½
Holmbush, 32s. 6d.	32s. 6d.	Rookhope, 21s.	21s.
Leadhills, £4½	£4½	South Condurrow, 9½	9½
Ladywell, 20s. 6d.	20s. 6d.	Tankerville, 4s.	4s.
Llanrwst, 40s.	40s.	Tincroft, 15s.	15s.
Marke Valley, 16s. 6d.	16s. 6d.	West Chiverton, 13s.	13s.
North Laxey, 7s.	7s.	West Pateley Bridge, 13½	13½
Cambrian, Carn Brea, Devon Consols, Dolcoath, East Caradon, Lovell, Minera, Tincroft, Van, Wheel Chiverton, Wheel Kitty, Argentine, Chicago, Colorado, Don Pedro, I. X. L., Javali, Malabar, South Aurora, Yorke Peninsula.		West Godolphin, 15½	15½
COLLIERIES.—Alltarn, Chapel House, New Sharlston, and Thorp's Gawber.		West Tankerville, 15s.	15s.
MISCELLANEOUS.—Devonport and Tiverton Brewery, Credit Foncier, Diamond Rock, Elbow Vale, General Credit, Halcumb Sack, Hudson's Bay, National Steam, Native Guano, Tramway, and Aquarium Shares.		West Wye Valley, 3½	3½
BANKERS: LONDON AND WESTMINSTER.		W. Grenville, 2½	2½
		W. Tankerville, 17s.	17s.
		W. Wye Valley, £3½	£3½
		W. Wheel Grenville, £3½	£3½
		W. York Peninsula, 6s.	6s.

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East Van, £3½	£3½	New Zealand Kapanga, 9s.	9s.
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Glenroy, 18s. 6d.	18s. 6d.	Pateley Bridge, 13s.	13s.
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COLLIERIES.—Alltarn, Chapel House, New Sharlston, and Thorp's Gawber.		West Tankerville, 15s.	15s.
MISCELLANEOUS.—Devonport and Tiverton Brewery, Credit Foncier, Diamond Rock, Elbow Vale, General Credit, Halcumb Sack, Hudson's Bay, National Steam, Native Guano, Tramway, and Aquarium Shares.		West Wye Valley, 3½	3½
BANKERS: LONDON AND WESTMINSTER.		W. Grenville, 2½	2½
		W. Tankerville, 17s.	17s.
		W. Wye Valley, £3½	£3½
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Glyn, 9s.	9s.	Richmond, 8½	8½
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Ladywell, 20s. 6d.	20s. 6d.	Tankerville, 4s.	4s.
Llanrwst, 40s.	40s.	Tincroft, 15s.	15s.
Marke Valley, 16s. 6d.	16s. 6d.	West Chiverton, 13s.	13s.
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COLLIERIES.—Alltarn, Chapel House, New Sharlston, and Thorp's Gawber.		West Tankerville, 15s.	15s.
MISCELLANEOUS.—Devonport and Tiverton Brewery, Credit Foncier, Diamond Rock, Elbow Vale, General Credit, Halcumb Sack, Hudson's Bay, National Steam, Native Guano, Tramway, and Aquarium Shares.		West Wye Valley, 3½	3½
BANKERS: LONDON AND WESTMINSTER.		W. Grenville, 2½	2½
		W. Tankerville, 17s.	

Lectures on Practical Mining in Germany.

CLAUSTHAL MINING SCHOOL NOTES—No. LV.*

BY J. CLARK JEFFERSON, A.R.S.M., WIL. SC.,

Certificated Mining Engineer.

(Formerly Student at the Royal Bergakademie, Clausthal).

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SECTION III.

At the back end of the casting forming the bed for the machine a staple-shaped strap is bolted at the sides, the bend of which forms a bearing for the end of the feed screw, being so fixed that the screw can rotate but not move lengthways. The extreme back end of the cylinder casting is closed by a hollow cover, which screws into the casting; the cover is further held by set screws. This cover forms a bearing for the nut which passes over the feeding screw, and attached to the nut is a ratchet wheel, which is moved by a pawl. As the screw is prevented (whilst the machine is at work) from being rotated by being screwed tight at the bearing formed in the bend of the strap, and as the screw is fixed by means of the strap, the rotation of the nut must carry the cylinder forward or backward with it. The pawl which actuates the ratchet wheel attached to the nut is hung on the short arm of a pivoted lever, the long arm of which extends through a slot in the cylinder, the long arm being so formed and placed that when the piston makes its back stroke the tappet on the piston rod comes into contact with the arm and raises it, depressing the short arm, and the pawl engaging in with the teeth of the ratchet wheel gives it, and consequently the nut, a partial rotation, advancing the cylinder. During the forward stroke the pawl slides over the curved faces of the teeth of the ratchet wheel, and to prevent the latter rotating under the jar and vibration small spiral springs are inserted in the back cover, and these bear against the ratchet wheel. The back end of the piston rod is bored out, but not screwed, to receive the front end of and act as a bearing for that end of the feed screw; this arrangement shortens the length of the machine. When it is wished to withdraw the cylinder from the face of the rock to change a borer, &c., the nut on the end of the feed screw on the outside of the strap is loosened, and the cylinder can then be withdrawn by rotating the feed screw by means of a hand crank. We have before mentioned that whilst the drill is being automatically fed forward towards the rock face the feed screw is prevented from rotating by tightening up the above nut. The friction on the ratchet wheel prevents its being rotated when the screw is being rotated by hand.

If all rocks to be drilled were of equal hardness, and if the drills were at all times equally sharp, it might be determined by experiment exactly what relations the teeth of the ratchet wheel, the pitch of the feed screw, and the stroke or vibration of the pawl should bear to each other, so as to have the forward feed of the cylinder made at each back stroke of the piston equal to the penetration of the drill at each stroke; but as rocks vary in hardness, and as the drills soon become blunt, a constant invariable feed would cause breakage of the machine when the feed exceeded the penetration of the drill too much; though some excess of feed beyond the penetration of the drill is admissible, because of the spring or yield of the carriage supporting the drill, and because of the elastic nature of the medium impelling the drill.

To prevent any injurious variation between the amount of feed and the penetration of the drill the following mechanism is devised to automatically regulate the above. In the same slot in which the long arm of the lever (which actuates the pawl for driving the ratchet) is placed is a small trigger, which is depressed by a small flat spring, so that when opportunity is offered, by the long arm of the pawl lever being raised sufficiently high, the trigger springs forward into position to catch beneath the end of the long arm of the pawl lever, and prevents its dropping down in the slot sufficiently far, for the tappet on the end of the piston rod to catch it, and consequently in this position of the trigger the backward and forward strokes of the piston rod are repeated, without any forward feed of the machine, until such times as the penetration of the drill shall have become so great as to allow the tappet on the piston rod at the end of the forward stroke to catch against and raise the trigger sufficiently far to allow of the long arm of the pawl lever slipping down into its old position (in which the pawl has also just slipped down one of the vertical edges of the ratchet wheel teeth), when the tappet catching it on the return stroke of the piston raises the long arm and depressing the short arm with the pawl, which rotates the ratchet wheel and the nuts through the space of one tooth, thus feeding forward the cylinder. In this manner directly the advance of the machine becomes much greater than the penetration of the drill the tappet on the piston rod does not advance sufficiently far to raise the trigger and release the long arm of the lever, so as to allow of its falling sufficiently far to be caught by the tappet on the return stroke. When the machine is worked regularly the tappet on the piston rod at the end of the back stroke raises the long arm of the pawl lever, and so far that the trigger immediately springs forward, and holds the lever up in this position till near the end of the forward stroke, when the tappet catches the trigger, and releases the pawl lever. As it might happen that when a feed of the cylinder takes place the piston might come in contact with the back cover of the cylinder, an india-rubber buffer is placed for the back end of the piston rod to strike against, though this may also, and ought to be, prevented by the compressed air cushion, which is formed by placing the entrance of the ports some little distance from the ends of the cylinder.

The Burleigh rock drill is made in various sizes; the largest, used for tunnel work, which are said to be capable of drilling holes up to 5 in. diameter, and feed 33 in. without changing for a longer cutter. The frame, or carriage, consists of two upright (slightly inclined inwards at the top) pieces of wood, which are bolted to two long horizontal pieces of wood, which are joined by two cross pieces, and further secured by long cross bolts. The upper end of the uprights are stiffened, or strutted, against the back part of the horizontal pieces of wood (which are fixed edgewise) by means of two flat iron rods. The upper ends of the uprights carry between them an axle, having in the centre a face plate, which bolts to the face plate on the machine. The face plate being circular allows of the machine being rotated about it, and it can also be rotated on the axle on trunnions between the uprights. This frame, although it does not allow of the drill being raised or lowered without raising or lowering the frame, is still very simple, inexpensive, and efficient, since in one position of the frame the machine can drill holes vertically upwards or downwards, inclined at any angle upwards or downwards, or sideways and horizontally.

For horizontal work the frame consists simply of two long beams of wood, joined towards the back end by two cross pieces of wood, and long cross bolts, and at the front end by an axle, having a central face plate, to which the drill is bolted. The long beams have each a pair of handles, so that the frame and the machine can conveniently be carried from one place to another by four men. To raise the drill sufficiently high sleepers or cross pieces of wood are packed under the front end.

The tripod stand for the Burleigh drill for sinking, quarrying, &c., is not essentially different from those for other rock drills. Mr. Brain, of the Daybook Iron Mines, Forest of Dean, finding the usual tripod stand unsuitable for the rough and confined bottom of a sinking pit, has designed a sinking stretcher for carrying the rock drill. The stretcher consists simply of a strong bar of iron, provided at one end with a short pointed piece, or shoe, and at the other end with a screw, by means of which it can be tightly fixed in any position across the shaft. The stretcher hangs in the shaft horizontally by means of a rope attached to the engine, or a capstan at the surface. By raising or lowering the rope the stretcher can

be brought into any position, and is then readily fixed in this position by means of the screw at one end of the stretcher. The drilling machine is moveable along the stretcher from end to end about the stretcher as an axle, and also about the circular face plate, by means of which it is attached to the slider on the stretcher. After boring a sufficient number of holes in the bottom of the shaft the stretcher is unscrewed, and raised out of the way by means of the rope. Mr. Brain had the holes charged with dynamite, and fired simultaneously by electricity. The following is a comparative statement of the results obtained in sinking by Mr. Brain with hand and with the rock drill:—1st. Hand labour for 14 days—12 sinkers, 12 shifts, at 5s. 6d. per shift, 39s. 12s.; 3 water fillers, 12 shifts each, at 3s. 6d. per shift, 6s. 6s.; blasting powder, 22s.; total, 47s. The depth sunk during this time was 3 yards, giving as the cost per yard 15s. 3s. 4d. —2nd. With machine working—3 sinkers, 12 shifts each, at 5s. 9d. per shift, 10s. 7s.; 6 labourers, 12 shifts, at 3s. 6d. per shift, 12s. 12s.; 2 engine stokers, 12 shifts each, at 2s. 6d. per shift, 3s.; 60 lbs. of dynamite, at 2s. per lb., 6s.; electric fuses, 20 per day, at 6d. each, 6s.; 12 tons of small coal for air compressor, at 10s. per ton, 6s.; oil, &c., 5s.; total, 44s. 4s. The depth sunk during this time was 5 yards, which gives as the cost per yard sunk 8s. 16s. 9d. The relative cost per yard by hand and by machine work was as 100 to 56, giving a saving in cost of 44 per cent. in favour of machine work, and an increase of 40 per cent. in speed.

One of the most improved forms of carriage, used for carrying four drills at once, consists of a skeleton frame on four wheels, carrying at its front end two horizontal bars—one at the top and the other at the bottom of the carriage—each carrying two drills, the arrangements for obtaining a universal motion being the same as above described.

The Burleigh rock drill has, perhaps, attained its greatest notoriety in connection with the driving of the Hoosac Tunnel, in Massachusetts. The following memoranda, given by Mr. W. Shanley, of drilling during ten shifts in a heading of the tunnel will give some idea of the capabilities of the Burleigh. The rock was a hard gneissoid rock, greatly permeated with quartz; the diameter of the holes was 1½ in. —Total time occupied in drilling, 38 hours 40 min. —2320 min. Total number of holes drilled, 120. Total number of inches drilled, 16,948. Average depth of holes, 11 ft. 8 in. Average number of rock drills used each shift, 6. Average number of inches drilled per minute, 7.3. Average number of inches drilled per machine per minute, 1.22. In doing so the drill points were changed 694 times, which gives 23½ in. as the average number of inches drilled by each borer. The maximum shift's work, included above, is as follows:—12 holes drilled in 150 minutes, the total number of inches drilled during the time being 1728, which gives 11½ as the average number of inches drilled per minute, and this, with six rock drills, gives 1.91 as the average advance per drill per minute. During this time the drill points were changed 51 times, which gives 23½ in. as the average number of inches drilled by each point before becoming so blunted as to necessitate changing.

In the driving of the Sutor Tunnel with the Burleigh the average daily advance in headings 9 ft. to 10 ft. by 14 ft., in which the rock was trachyte, from July to November, 1874, was 11 ft. and 12 ft. per day. The machines worked up to 300 blows per minute, with a pressure of from 60 to 70 lbs. per square inch. The drill points are generally made with four cutting edges for hard rock. In Aberdeen granite the Burleigh is said to bore on an average 20 in. without re-sharpening.

The Burleigh rock drill is said to give great satisfaction in not requiring constant repairs. As an exceptionally good instance which occurred during the driving of the Hoosac Tunnel may be cited that one machine during 24 months drilled a length of 5300 ft. (holes 1½ in. in diameter) without requiring any repairs.

OSTERKAMP, of the Eschweiler "Bergwerksverein," has patented a rock drill, which is especially remarkable for its lightness, being made in three sizes, with the cylinder 2 in., 2½ in., and 3 in. in diameter, the machine alone weighing respectively 25 lbs., 40 lbs., and 55 lbs. without the frame, which weighs from 45 to 60 lbs., so that the machine can easily be managed by one workman; this advantage, however, is obtained at the sacrifice of the automatic advance of the cylinder as the bore hole gets deeper. This forward feed of the machine is effected by hand by means of a small crank or handle at the back top end of the carriage. The carriage for the machine consists of a cast-iron bed, along which the cylinder casting is made to slide, and by means of a nut attached to the cylinder and a long screw in the slide, which is provided at the upper end with a handle or crank, the cylinder is fed forward by the workman. To the top end of the carriage a strap is attached, by which the machine can be supported against the chest of the workman; at the back a sliding leg is hinged, as in the case of the sinking arrangement of Sach's drill, so that the machine can be readily placed in any desired position. The machine is said to be capable of boring an 1½-in. hole 1 in. deep per minute, or a ½-in. hole from 1 to 1½ in. deep per minute in sand-stone. The gradual rotation of the borer is effected automatically by means of a ratchet wheel placed at the back or top end of the cylinder. This appears to be the most defective part of the construction, the experience having been made in Upper Silesia, in Westphalia, and at Bleiberg that the rotation of the machine is too rapid at the commencement of boring a hole, and too slow towards the end of boring, and the machine is said to be wasteful as regards the quantity of compressed air used. The supposed advantage of lightness, however, forms another defect in this machine, which cannot withstand such heavy blows as one of heavier construction, and in consequence of its lightness its effect is much less than that if it were heavier, and the hand feed requires closer attention than can as a rule be expected of workmen.

Another rock drill lately patented (in 1873) in England is that now known as the Kainotom. This machine is the invention of Bryden and Davidson, of Whitehaven, Cumberland. The Kainotom consists of a rather long cylinder, which by means of side projecting pieces running the whole length of the cylinder is carried on a hollow bed or casting. These lugs contain a planed slot running their whole length, and in which two planed ledges of the casting slide, or rather on which the corresponding lugs or projecting pieces of the cylinder slide. The piston rod carries two very thick pistons, having a short space between them. Each piston contains several grooves for piston rings. The cylinder itself is about three and a half times the length of the stroke. The valve forms part of the sector of a circle, and is centred and rocks on a bolt or pinion passing through the valve and steam chest, and serves also as one of the bolts for the valve chest cover. The working face of the valve and valve chest is placed vertically, and not horizontally, with respect to the cylinder bed. To the valve, or rather forged in one piece with it, is a lever, the end of which projects down into at one side of the cylinder, where it carries a lug, or projecting piece, which projects further into the cylinder. This lug is caught alternately by one or other of the pistons, and thus imparts a rocking or vibratory motion to the valve, which alternately covers and uncovers the steam ports. The valve arrangement is essentially that of the ordinary slide valve—with a central exhaust port between the two inlet ports, the escaping steam passing from the inlet port through the hollow under side of the valve, only in this case the sliding motion is around a fixed centre, and not in a straight line, as in the ordinary slide valve. The front end, or cylinder neck, is of comparatively great length, and carries a loosely fitting tube. This tube is held in position by a cap or collar, which screws into the front end of the neck. This tube is provided with a spiral groove in which a key or feather attached to the piston slides; the back end of the tube carries a ratchet wheel. In the cylinder neck a ratchet pressed downwards on the ratchet wheel by a spiral spring is fitted, and so arranged that no rotation of the ratchet wheel, and consequently of the tube, can take place during the back stroke, which thus necessitates the rotation of the piston and borer which is attached to it during the back stroke. The friction of the pistons and piston rod is so much greater than that of the loosely fitting tube that the latter when not checked by the ratchet during the forward stroke rotates rather than the piston rod.

Within the hollow casting forming the bed or carriage of the cylinder and bearing in both ends, in lugs cast on the cylinder, is a long screwed shaft, over which a nut attached to a bracket on

the bed passes. This travelling nut carries a bevil wheel, which gears into a second mounted on a spindle fitting into the above bracket. This bracket carries on the inside of the bed of the cylinder a box or couple of lugs, between which the travelling nut and the bevil wheel attached to the latter are carried. On the square projecting end of the spindle carrying the bevil wheel a small handle or crank can be fitted, and by these means the cylinder can be fed forward by hand.

By fixing a toothed wheel on the front end of the loose tube, and leaving a corresponding slot in the cylinder neck, the rotation of the tube may be communicated to the screw by fixing a pinion on to the end of the screw, or to a spindle fitting into the end of the screw, to gear in with the toothed wheel on the tube. By a peculiar arrangement it is so contrived that the loosening of a single set screw allows of the machine being placed in any position in which it is fixed by the tightening up of the same screw. This arrangement consists of a clamp, through which passes the cylindrical bar on which the machine is supported. This clamp is provided with a circular boss, which passes through a circular opening in the casting forming the cylinder bed. This boss is screwed at the upper end, on which a circular collar screws; the machine can thus be rotated about this boss as a centre. In the clamp are two gripping pieces, the one fitting against the underside of the cylinder bed, and the other being placed on the opposite side of the round bar, against which the set screw tightens. By this means, when the set screw is tightened up, the gripping piece next to it bears against the round bar, and this against the second gripping piece, which tightens against the underside of the cylinder bed. It will thus be seen that on loosening the single set screw the clamp and machine can be rotated about the round bar, and at the same time the machine itself can be rotated about the circular boss on the clamp, allowing of the drill being placed in any desired position.

THE DAVY LAMP, AND OUR COAL SUPPLY.

The monthly meeting of the Manchester Geological Society was held on Tuesday, at the Literary and Philosophical Society—Mr. JOSEPH DICKINSON, F.G.S. (Her Majesty's Inspector of Mines), the President of the society, occupied the chair.

SAFETY LAMPS IN MINES.

The PRESIDENT read a paper "On the Davy Lamp, and Blasting in Mines." He said—The Davy lamp is known to be safe only under certain circumstances. It may be put into an explosive or inflammable mixture, and if withdrawn quietly the gas flashes or burns inside the gauze, sometimes putting the light out and sometimes not, but without flame passing through the gauze. The standard mesh of the gauze is 784 apertures (28 by 28) to the square inch. With this the cooling property appears to be such as to prevent the ignition of gas externally until the gauze becomes red hot, or unless there be some defect in the lamp or some easily firing or flaming substance on the gauze. I have on hundreds of occasions had to trust my life to this kind of lamp. The practice is to lift it up towards the roof. If held for a short time till it gets heated it apparently indicates better. Many prefer trying with a very small light, as the indication may then be seen best. Looking through blue glass is also now said to be an improvement. The usual indication is a blue cap on the flame, but the whiter it is the quicker it fires. If the cap begins to tail up or the flame to flutter, and there be time, it is best to lower the lamp without allowing it to fire, but always gently. When the top of the lamp touches the roof without showing gas, the practice in some districts, but which is reprobated in others, is to place the lamp sideways, in order to test the uppermost part, where fire-damp naturally lies. The gauze of the Davy as commonly used is about 5½ in. in length by 1½ in. in diameter, with a cap for the top. This, according to the experiments recorded (p. 39, vol. 17, North of England Institute of Engineers), admits of flame passing through, or of external ignition at a velocity of 1½ ft. per second, or 690 ft. per minute. Should a person get into an explosive mixture where the lamp fills with flame and continues burning, notwithstanding that the wick be drawn down, and there is no escape, the special colliery rules of this district enjoin that he must smother it out. How that may best be done is left to his own discretion. If water were near he might probably dip it in, or if dust cover it, or put it into his woollen jacket. Under such circumstances there is some risk. In Scotland the Davy lamp is used by the firemen in trying places, but that used by the miners is called a gauze lamp. The principle of the two lamps is the same, the difference being that the gauze lamp is larger, and gives better light. At a time like this, when the public mind has been excited by a very serious explosion, and when, as I am informed, the Coal Association are discussing the question of lighting and blasting in mines, it may be useful to review the regulations which are now in force. The rules under the Coal Mines Act are very strict, and the special rules of this district supply further conditions. The powder rule is very stringent. Powder may only be taken into a mine in canisters containing not more than 4 lbs. If fire-damp has been found in that part of the mine within the preceding three months the powder must be in cartridges, and the shots may also be fired under the supervision of a competent person appointed for the purpose. If the mine be very fiery, according to the test enjoined of showing indications of gas as it issues from the strata notwithstanding adequate ventilation, shots may only be fired when the ordinary work-people are out of that part of the mine. And, lastly, it may not be used at all unless it is safe. Further than this, it appears impossible to go unless by total prohibition. The condition of the use of open lights is shown by the explosions at Blantyre, with 209 lives lost, and 114 at Cymmer, to be unreliable. But to forbid the use altogether would be to sacrifice the advantages given to science. A vote of thanks to the President for his paper was passed, on the motion of Mr. GRIMSHAW, seconded by Mr. C. HARDWICK.

THE COAL FIELDS OF EUROPE.

Mr. W. H. JOHNSON read a paper "On the Resources and Future Development of the Coal Fields of Europe." He gave the following statement of the several coal-producing countries of the world:—Great Britain, in 1876, 133,344,766 tons; United States, in 1874, 44,091,922; Prussia, in 1876, 42,819,345; Belgium, in 1876, 14,786,160; France, in 1867, 12,148,223; Austria, in 1862, 4,552,500; Australia and New Zealand (estimated), 3,000,000; British North America, 1,500,000; Mexico and Chili, each, 1,000,000; Italy, in 1862, 775,000; British India, in 1868, 564,933; Spain, in 1862, 388,950; Russia and Poland, 262,500 tons. It would, he said, be seen that Great Britain occupied by far the highest position, in point of production and output being about equal to all the other countries together. There was, however, no doubt that we had developed our resources much more thoroughly than other countries, and that, though our coal fields could maintain their present output for 1040 years, some of our coal deposits would be worked out long before that time.

Speaking of the various coal districts of England, he said that the fields of Lancashire and Cheshire could probably maintain the existing output for 800 years, as, besides the visible, there were large concealed supplies. Looking, however, at the vast and increasing industry of the district, they could not boast of having too large a supply of coal. The greatest future extension of mining enterprise in Great Britain was to be looked for, first, in the South Wales basin, which contained probably 32,000,000,000 tons, or one-fourth of the whole available supply in Great Britain, while its output at present was only one-ninth. The future prospect of the great coal fields of Yorkshire, Derbyshire, and Nottinghamshire was equally bright. They had an available supply of 41,000,000,000 tons, or nearly one-third of the whole available supply of the United Kingdom. This abundance of excellent fuel must rapidly increase the manufacturing industry and prosperity of these districts.

In the course of a brief discussion, Prof. W. BOYD DAWKINS said that they must look to the United States as having by far the largest supply of coal of any country in the world. He looked upon that region as the centre towards which industrial enterprise would ultimately converge. We English came to this country because it was better than we left, and we called it after our name, and he had no doubt that we should go in the end—that coalowner after coalowner would go—to America, leaving this country behind

* Being Notes on a Course of Lectures on Mining, delivered by Herr Bergstrath, Dr. VON GROSSEDDEL, Director of the Royal Bergakademie, Clausthal, The Harz, North Germany.

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A paper on a system of boring practised in Westphalia was postponed to the next meeting.

THE CONTINUATION OF THE COAL MEASURES EAST AND SOUTH OF THE BRISTOL COAL FIELD.

An interesting lecture on this subject was delivered at the Bristol Mining School, on Monday, by Dr. WALTER SAISE, D.Sc. Association Royal School of Mines.

The chair was taken by Mr. W. PROCTOR BAKER, who, in introducing the lecturer, said it gave him no ordinary pleasure to preside on the present occasion, inasmuch as Dr. Saise was a gentleman who had received his education at that school, had terminated his academic career by taking the highest degree in science the London University had to offer (he was, he believed, one of the youngest doctors that University had made), and now commenced his professional career as a mining engineer, under circumstances of great promise.

Dr. SAISE, after asking for the indulgence of hearers on the ground of his having been, but a few years since, a student himself, proceeded with his lecture. He pointed out briefly the characteristic features of the Bristol coal field, and referred to its former connection with the South Wales basin, with which it had many characters in common. He added the discovery of the Severn coal field as confirming this in a marked manner, and as an example of the power of geological reasoning which had predicted its existence before it was really discovered. He then showed that the evidence pointed to a continuation of coal measures to the east and south of their present known limits, and to support this reviewed in detail the chief features of the Westphalian, Aachen, Liege, and Valenciennes coal fields, and called attention to the resemblance between them and the Bristol coal field. He would on these grounds continue this

hand of coal measures westward until it passed into the Bristol coal field. He said that the late discoveries justified in every way the belief in the existence of coal east of Bristol. The presence of the Devonian at 1000 ft. under London pointed to the continuation of the Mendip ridge in that direction. The boring at Whitney, in Oxfordshire, where coal measures were reached at 1200 feet, and a seam of coal at 1350 ft., proved that the reasoning adduced had been correct. He thought that more valuable results might be obtained further south than Whitney, but it was impossible to fix on any place and say that coal did exist there. He then showed the probable extent of the coal growth area of which the South Wales, Bristol, Liege, Aachen, Westphalian, and Saarbrücken coal fields are now the detached fragments. He then dwelt upon the nature of the disturbances which had resulted in the upheaval of the Hohen Venn, the Ardennes of the Mendips, and the breaking-up of the coal growth into the coal fields on their northern flanks, and the coal fields of Saarbrücken and Devonshire. He showed that near Liege the force of upheaval had been greatest, and consequently that here the width of the band of coal measures was least. He pointed out that Westphalia and South Wales had a greater width, and expected the coal measures under the newer strata would be as wide, and, therefore, presented a prize to enterprising landowners. He referred briefly to the boring in the Weald, and hoped it might be successfully carried out. He was sanguine that coal measures existed there, as he thought the thickening of the newer strata indicated that conclusion, and the coal fields of the Boulonnais and of Devonshire also pointed to it. Still the measures might be unproductive; whereas in the case of the coal measures lying north of a line drawn from the Mendips through London there was every probability of finding good coal. After briefly referring to the difficulties that the sinking of pits through the cretaceous strata might present, and expressing a belief that these difficulties could and would be successively met, the lecturer concluded.

A vote of thanks was moved by Alderman Fox, Master of the Society of Merchant Venturers, who said that the society took a great interest in this school, and, as Master, he had much pleasure in moving a vote of thanks to Dr. Saise for the able and scholarly paper to which they had just listened, and to wish Dr. Saise a very prosperous career.

Mr. HANDEL COSSHAM, in seconding the vote of thanks, said he had himself given considerable study to the subject of the extension of the Bristol coal field, and could coincide with the arguments that had been adduced by Dr. Saise. He thought that there could be but little doubt that our coal deposits were much more extensive than generally supposed, and felt that the speculations of Dr. Saise were fraught with great commercial importance. He congratulated the school upon the success of its old scholar, and hoped that it would give many equally able engineers to mining industry.

Mr. WILLIAM MORGANS, of Mella, on the part of the mining engineers of the district, spoke of the great interest of Dr. Saise's speculations to gentlemen engaged in his calling.

The CHAIRMAN, in putting the vote, said that the trustees were much indebted to their old scholar for his lecture, and pleased to see these lectures, which his colleagues and himself regarded as one of the most important phases of the work of the school, so highly appreciated by the engineers of the neighbourhood.

The vote of thanks was carried by acclamation, and Dr. SAISE, in thanking his audience, expressed a hope that he might be able to offer future professional assistance to the school.

NEW LIME LIGHT.

At the Warrington Literary and Philosophic Society meeting Mr. Fletcher exhibited a new lime-light not requiring oxygen gas. He stated that until about five years ago metallurgists and others had no practically available source of heat for experimental work, giving temperatures between that of an ordinary gas or lamp blowpipe, and the oxyhydrogen jet or electric arc. It became absolutely necessary for his own purposes that this great space in available temperatures should be filled by some means, and the hot-blast blowpipe he now exhibited is one of the first results of his earlier experiments. With this a thick platinum wire is easily fused, and the intermediate point between the temperatures of the oxyhydrogen flame and the common blowpipe is here in a simple and practical form. This was no sooner made public than the form and arrangement was used and made all over the civilized world, showing that his own wants had been felt by thousands of others.

When this blowpipe got into the hands of the experimenters there was a general idea that a lime-light could be obtained from it, and the danger and cost of making oxygen gas could be done away with. All these experiments failed, as they had done in his hands, although his own failure might have arisen from the fact that he had no interest in the matter, and only tried a few experiments to amuse friends. The reason of failure is that the high temperature jet is exceedingly small, and only illuminates a tiny spot of the lime; if made larger in size the temperature falls too low to be of service for this purpose. For three or four years he paid no attention to the matter, but recently it has forced itself on his notice as the outcome of some experiments in a totally different direction, and he has obtained what is possibly the germ of a practically available light, which has a distinct actinic or chemical power, and is white, showing all colours precisely as in daylight. He explained that the little furnace which he exhibited a toy to look at will melt with ease 1/2 lb. or more of copper, cast-iron, and steel, and he thought with a little modification would fuse platinum. It certainly will, with a simple blow-pipe, often a crucible of the most refractory clay.

Some time ago needing a small block of caustic lime which he had not at hand, he put a bit of limestone in his furnace to burn the carbonic acid out. On looking at it in a few minutes he found the lime illuminated the workshop, and the light was painful to the eyes. This suggested the point that if an ordinary lime cylinder were protected by a non-conducting casing over all parts except when the light is required, a good light might be obtained. The casing he uses to the lime is the same as that of the furnace—that is, a mixture of one part gannister or refractory clay, and six of sawdust, rammed in a mould and fired. This makes after burning form a cellular mass, in texture almost like pumice stone, and its power of retaining heat is such that in this casing, which is only 1/2 in. thick, he can melt 1/2 lb. of cast-iron with a simple blow-pipe, and can then take the furnace, crucible, and all in his hand without feeling the heat to any inconvenient extent. As a pocket for ordinary furnace work this mixture will, perhaps, prove one of the most valuable materials, in all the places except when exposed to mechanical wear. The lime-light burner which he exhibited is simply a block of lime partially covered with this material, and a blow-pipe of ordinary construction, except that the gas is mixed with air to a certain extent before the blower comes to meet it. Owing to this previous mixture, the blower has less air to supply, and the combustion is quicker; in fact, so rapid and perfect is the combustion of gas that this blow-pipe on a larger scale may compete with the hot-blast. A sheet of platinum gauze held in the hottest part of the flame is fused and perforated almost instantly, and the lime becomes sufficiently heated to give a white light, which, with the assistance of Mr. Paterson, he had tested, and found to be equal to about 95 candles. This flame is noisy and quite unfit for the

magic lantern. In fact, he could hardly say whether it is more than a toy at present; there is, however, the possible germ of a greater future in it.

Meetings of Public Companies.

CONDOS COMPANY OF CHILI.

The annual general meeting of shareholders was held at the offices of the company, London Wall, on Wednesday.

Mr. GEORGE BATTERS in the chair.

Mr. J. E. DAWSON (the managing director) read the notice convening the meeting. The report and accounts were taken as read.

The CHAIRMAN, in reply to a question, said he was the only director present. The report and statement of account had been sent to the shareholders, and he had no remarks to make upon them, inasmuch as he was not supported by any other member of the board. He had simply to ask the shareholders to accept the report and accounts, not to pass them. He considered both alike unsatisfactory.

Mr. Sills had, as the shareholders were aware, ceased to be a director of the company. Mr. Lloyd Foster, owing to an accident in the hunting-field, was unable to attend to the business of the company, and Sir William Smith was also unable through illness to be here to-day. No doubt the meeting was a very unpleasant one; but he would be very happy to reply to any question which he possibly could. As far as he was personally concerned he placed his resignation in the hands of the shareholders, and he could say the same for Sir William Smith. Mr. Lloyd Foster was the director retiring by rotation, so that his resignation was virtually at the disposition of the shareholders. All he asked for was a free course and fair running. He was prepared to justify his conduct with regard to the company, and he thought when the shareholders heard the explanations which would be given they would not think so harshly as they might be led to suppose from the unfortunate disappointments they had suffered, and the present unsatisfactory position of the company. He believed they had a very valuable property, and that it would, if properly worked, be worth all it was said to be worth when it was sold. (Hear, hear.) He saw no reason why they should lose their money, or any portion of it; but it was really a question of management. (Hear, hear.) He (the Chairman) then entered into the details of the purchase of the property on the report of Capt. Coward (the manager of the Argentine Gold Mines) confirming the report of Mr. Phillips, from whom the mines were purchased. Mr. Thomas Secombe, who came to the company with the highest references, was sent out as manager of the property in the spring of 1876, the shipping season in Chili having by that time closed—the seasons in Chili being about the reverse of those of this country. Mr. Secombe arrived at the close of April, and on May 18 telegraphed that he had made a cursory examination of the mines, and was fully satisfied of their value. He also said he believed that the Iquica lode would easily produce 300 tons of ore per month, and that the mines could be worked all the year round. He (the Chairman) saw no reason why, even now, with proper organisation the shipments should not be 400 or 500 tons of ore per month, and that the company should derive good profits from the working of the mines. Having given the substance of the succeeding advice from Mr. Secombe, he (the Chairman) advised the shareholders to form a committee of investigation, so as to be able to place before their own body the whole of the particulars connected with the formation and subsequent history of the company. (Hear, hear.) He had nothing to disguise in the matter, for he had done the best he could to protect the interests of the shareholders, and if he had failed in any way it was certainly not because he had not tried to make the company a success. A good deal had been said about the cost of extracting the ore and sending it to England. The original estimate of Mr. Phillips was that it would cost about 63/64. per ton of ore f.o.b. at Valparaiso, which, with freight and other charges, would bring the amount per ton on arrival in England up to about 9/10s. The ore sent lately had realised as much as 22/ per ton, so that there was every reason to hope that the company would make good profits out of its shipments of ore to England. The average amount realised for the ores sent was about 13/ per ton, but it must be remembered that that was for ore sent in an undressed state, which proved that the lode must be an extremely rich one. His firm opinion was that the loss sustained by the company was attributable solely to their smelting works, which he believed had now been stopped for some time.

Mr. WILDE agreed with the Chairman that the best course for the shareholders to pursue was to appoint a committee to see what the mine was worth, whether it was valuable enough to justify them in continuing to work it, and how it was to be managed in future. He wished, however, to know how it was that the company was started without enough capital to pay the purchase-money, for he understood that the whole of the purchase-money was not yet paid. It had been said that no working capital would be required, as shipments of ore would begin at once; but he thought it would have been far better to have had some amount of money to fall back upon. He wished also to know who was the actual vendor of the property. The CHAIRMAN replied that Mr. Phillips was the vendor of the property, and none of the directors, either directly or indirectly, received one farthing upon the transaction. The whole of the purchase money had now been paid. If the whole of the shares had been taken up, and the calls paid upon them, there would have been 10,000/ as a working capital, but as it was there was a considerable amount outstanding upon shares in arrears of call, and a great many had been forfeited on that account. He was quite sure both directors and shareholders believed originally no working capital would be required; but the real mistake had been the smelting works. Mr. Secombe had from time to time written stating the difficulty he had in getting a reliable accountant to make up the accounts, and he lately wrote that if the difficulty continued he should telegraph for an accountant. The directors concluded, as he had not telegraphed, that the accounts would be forthcoming. Several mails, however, have since arrived, but no detailed accounts. The directors had, therefore, sent out Mr. Coombe, a gentleman of standing and experience, to investigate the whole of the matters, and to render an independent balance-sheet. This was one of the reasons why he did not ask the shareholders to pass the accounts as presented, but to wait until Mr. Coombe could write or report in a satisfactory manner.

Mr. WILDE remarked that from what was supposed to be known of Mr. Coward he thought the directors were quite justified in trusting in his report, and he believed he would himself have accepted it as the directors had done, but he wished to know what were the antecedents of Mr. Secombe.

The CHAIRMAN replied that Mr. Secombe had been the manager of the Marke Valley and Phoenix Mines, and was the agent for several of the lords in Cornwall. He had employed Mr. Secombe to inspect properties for him, and had always had reason to approve of his conduct.

Mr. C. S. HILL also referred to the financial position of the company, and the difficulty the directors had experienced in getting the accounts from Chili. The CHAIRMAN having, in the course of a discussion, replied to various questions, Mr. SNELL proposed that the consideration of the accounts should be deferred until a future meeting.—Mr. WILDE seconded the motion, which was carried unanimously.

On the motion of Mr. BAKER, seconded by Mr. STEPHENSON, it was resolved that a committee of investigation should be formed to enquire into the formation and incorporation of the company, its subsequent management, and its present position. The following gentlemen were appointed as the committee:—Messrs. Baker, Hill, Ware, Wilde, Burley, White, and Turner.

The CHAIRMAN, at the recommendation of the shareholders, stated that the directors would elect Messrs. Baker, White, and Hewett to seats at the board. The proceedings terminated with a vote of thanks to the Chairman.

WHEEL GRENVILLE MINING COMPANY.

A general meeting of shareholders was held at the offices of the company, St. Andrew House, Cornhill, yesterday.

Mr. R. W. GOULD in the chair.

Mr. T. B. LAWS (the secretary) read the notice convening the meeting. The minutes of the committee meetings, and of the ordinary and special meetings, were read and confirmed. The accounts showing a cash balance of 953/4. 6s. 7d., were taken as read.

The CHAIRMAN said the shareholders would doubtless have noticed that the figures presented in the accounts were of a somewhat heavy nature, but they must not forget that the work sanctioned some six months ago had been, and still continued to be, of a very heavy nature; and he would only refer to this matter so far as to say that the committee had given their utmost attention, and he was sure their manager, Capt. Hodge, had, that the work sanctioned should be done in a thoroughly efficient manner, with a view not to the present but to the future working of the mine and to its future interests. The amount of money spent was large. The present management had received something like 17,000/ since they had been in office, but it should not be forgotten that between 6000/ and 7000/ of that amount had to be spent immediately to clear away the debts or liabilities of the company, so that they had really only to deal with about 10,000/ at least. The experience of last year involved them in a loss of 2000/ at least. For a considerable period during the winter they were all but drowned out of the mine, the water having risen, he believed, nearly to the 80, and he could not more forcibly illustrate the necessity of the work than the very large quantity which had taken place than by stating that there was some risk of their having even a second experience of the difficulty. When he heard people saying that they were frightened by a little extra water last season he could only think that they were either very much informed or that they were, to render into plain English the signature of one person who had written on the matter, "Verb. Sap." The water was even now about 8 ft. above the 150, and it was whether, with all Capt. Hodge's exertions, he would be able to get into the 150 ft. level again for the present. There was nothing which showed more strongly that the committee were justified in the large expenditure they had gone to than that fact. That left them (say) 9000/, and of that, he believed, 2000/ would be found to have been expended in consequence of the inefficient and insufficient stamping. If they had had sufficient stamping power he believed the returns would have been 14 or 15 tons per month instead of 9, 10, or 12 tons; and that the loss would have been very considerably less than 2000/. That left them 7000/, and he was willing to assume for the moment in maintaining and developing the property. He considered that that 7000/ added to their capital had been thoroughly well spent. (Hear, hear.) They had purchased a perfectly new powerful 80 in. cylinder engine, but the engine had not been erected as a steam engine, but as an engine for the more speedy lowering of pitwork, an engine for stamping purposes, two axes and all the necessary appliances for the engine, which would by and bye work with 70 instead of 48 heads of stamps; new buddles, had cut the shaft from surface to a depth of 150 fathoms, and had sunk the shaft from the 140 to the 150. Could it be expected that all these things could be done at a less expenditure than 7000/? If the completion of these works did not increase to a greater extent than between 10,000/ and 12,000/, he, for one, would be very well satisfied.

The mine could not possibly have been carried on if this work had not been done. The improvements had been effected as economically, and very nearly as quickly, as anticipated, notwithstanding the weather. At the last meeting, which was held on the mine, the shareholders had an opportunity of observing the character of the work throughout the mine, the style of materials being used, and they were unanimously satisfied with what they saw. Since that time a deal of work had been accomplished. The new engine was ready to go to work. The engine-house was also completed, and three boilers had been placed in it. A fourth boiler would be taken from the old engine-house to avoid purchasing a new one. Further than that he thought he need not say what had been written about the work done. It had been said that the committee had gone to work extravagantly, and to meet this charge, if any of the shareholders (unlike those who attended the meeting in Cornwall) were of the same opinion, he would propose that the shareholders should appoint a mining captain, and he himself would send Capt. Josiah Thomas, and would pay the whole expense of a thorough examination into the work. With regard to the details of the work and the future prospects of the mine, he thought he had better leave Capt. Hodge to refer to those matters. A considerable sum of money would have to be spent during the next two months to complete the work now in progress, and to pay for the engines, but after the close of the current quarter he thought Capt. Hodge would be able to say that all extraordinary costs would be done away with, and that in future they would have a clear balance-sheet, with perfect machinery at work, and no other expense but the ordinary costs of working the mine. Even at the present price of tin, he believed Wheel Grenville would then pay. It was a matter for congratulation that the committee had been so well supported by the shareholders throughout. Of the 587 forfeited shares which were at the disposal of the company at the previous meeting only 25 remained unappropriated at present. If no shareholder was willing to take these shares he was quite willing to do so himself, at the price originally named—3/6. per share.

The CHAIRMAN considered the report very full and very satisfactory, and he only hoped their experience during the next few months would fully bear out Capt. Hodge's anticipations. He then moved the adoption of the report and accounts.

Mr. WADDINGTON seconded the motion, and it was carried unanimously. After some conversation a call of 8s. per share was made, to provide for the costs during the current quarter.

The question of dues having been raised, the illiberality of the present lord of the mine (the executors of the late Mr. Fortescue) was commented upon, and a resolution was passed, on the motion of Mr. WADDINGTON, seconded by Mr. SEWARD, requesting the committee to communicate with the executors of the late Mr. Fortescue, and to endeavour to obtain a remission of the dues now applied for—1-30th.

Mr. LAKE said he was afraid they would have again to avail themselves of the Chairman's kindness to lend the company some money without interest. (Hear.) A vote of confidence in the committee was passed unanimously, and ordered to be entered upon the minutes.

Capt. HODGE, in reply to questions, said he thought a further expenditure of 2000/ or 2500/ would complete the works upon which he was now engaged, and they could then, he believed, at once meet the expenses. The greater part of the tin raised was being obtained from points either abandoned or not discovered by the previous manager.

The CHAIRMAN read a letter from Mr. Laws resigning his appointment as secretary, and the resignation was accepted.

The proceedings terminated with a vote of thanks to the Chairman.

DOLCOATH MINING COMPANY.

The quarterly general meeting of adventurers was held at the account-house, on Monday.

Sir F. M. WILLIAMS, Bart., M.P., in the chair.

The usual preliminaries having been disposed of, the accounts to the end of November, showing receipts (after deducting 687/ 10s. 5d. for dues) for about 330 tons of tin sold, 13,072/ 10s. 5d., whilst the total expenditure was 12,000/ 17s. 6d.—leaving a profit on the three months' working of 1071/ 13s. 2d., together with the report of the agents were submitted. The agents reported upon the various points of operation, and Capt. JOSIAH THOMAS said the mine was still looking exceedingly well. The deepest point was about as good as ever, the bottom of the engine-shaft being reported at 120/ per fathom, and the rest of the mine was very much the same as at the last account. Their air-compressor was so small that they could not go on as at present. It was continually getting out of order, and the boring machine men were constantly being hindered in their work, and whatever machine they ultimately adopted they must have a larger steam engine and compressor. The committee had adopted a very wise course in recommending that this new steam engine and compressor should be erected at once. Major Beaumont had offered to drive their levels by his boring-machine under a contract for 12 months, but the committee considered the price was higher than they ought to give. He had had communications with other rock-boring companies, and it was possible that offers might be made by them. But the erection of the steam-engine and air-compressor would not at all interfere with any contracts that might be entered into.

The CHAIRMAN remarked that the committee had had the question of the boring-machine under their consideration, but as yet they had been unable to come to any decision as to which was the best machinery to adopt. They, therefore, suggested that the matter should be left in the hands of the committee until the next meeting. One thing was quite certain, and that was that they must have a larger steam-engine and compressor before they could go on with their boring, and this would cost about 500/. While referring to the operations of the mine, he would take the opportunity of expressing his and the entire committee's great regret at the recent death of Capt. Bawden, one of the agents of the mine, who for years served the adventurers most faithfully, and to the entire satisfaction of the committee. The adventurers would recollect that at the last meeting it was decided that an application should be made to Mr. Basset for a reduction of dues, in consideration of the contemplated erection of additional machinery. He regretted that he was unable to tell them that the reduction had been granted, but the way in which Mr. Basset had given his refusal said much for the value of the mine.

Mr. Basset had written them that he had carefully investigated the past history and present condition of the mine, taking up the financial history from 1846, when the mine being nearly exhausted for copper, the idea was first entertained of calling up capital to convert it into a tin mine. At the time referred to the mine was divided into 186 shares, of which Mr. Basset's then predecessor held 32, and was the largest individual shareholder in the company. It is, Mr. Basset continues, "unnecessary for me to detail in exact sequence all the subsequent operations and arrangements between the lord and the adventurers, but I may state that the timidity of the latter was so great that the owner, as an inducement for them to embark in the speculation, guaranteed the repayment of the capital, then required, out of the dues. The total amount of capital then and subsequently called up was 3084/ of which the lord, as holder of 32 shares, contributed at the time rather more than one-sixth, and subsequently repaid the whole balance to the adventurers. The first dividend was declared in April, 1853, and periodical dividends continued from that date till February, 1854, when they suspended, and the profits applied to the erection of a man-engine, till October, 1855, when dividends recommenced, and have continued without intermission ever since, and during the period under review of 31 years the adventurers, upon an outlay of 3084/ repaid to them by the proprietor, have received in dividends 320,000/ and paid in dues 71,000/.

I have carefully studied your manager's last report, and among other interesting facts, he represents that the mine never was so productive as at the present time; and with a view of increasing the returns, and also diminishing the working cost 20 per cent. he recommends your purchasing new boring apparatus, at a cost not exceeding 2000/ and it is in respect of this I am asked to reduce my dues. Whenever old mines are making calls or have not realised a fair return on the capital expended in working them, following the example of my predecessors, I have uniformly abated my dues, but in the face of the foregoing astounding facts, unparalleled I should suppose in the annals of mining, I must decline to comply with your application. I acknowledge myself fortunate in being the owner of such a mine, but I think I may be permitted to congratulate you and your co-adventurers, on being the still more fortunate participants of it under the circumstances, and in the proportions I have described." They could not, the Chairman continued, regard this answer as other than complete and decisive. He had now only to move the reception and adoption of the report and accounts, but before doing so he would express his pleasure at seeing present their old friend, Mr. Mark Guy Pearce, of London. Mr. Pearce was the largest shareholder in the mine, and although the distance at which he resided prevented him from coming so frequently to their meetings as he formerly did, he had never ceased to take a very active and lively interest in all that concerned the success of the mine and welfare of the adventurers.

Capt. ABRAHAM JAMES hoped that the committee had not given up all hope of obtaining a reduction of dues. He considered that Dolcoath had a fair right to expect this concession, seeing that it was paying a larger amount of dues than any other mine in the district.

Capt. THOMAS remarked that personally he did not think it was much use to trouble Mr. Basset again, for nothing could be more definite than the answer he had given to the application already made to him. He thought it should not be forgotten that Dolcoath was the first mine in the county that ever introduced successful rock boring machinery. Although several trials were made before, they failed to prove, as Dolcoath had done, that those machines could drive faster than hand labour, and at much less cost.

Capt. JAMES said he regarded that as a reason why their dues should be reduced, as an aid to the erection of the additional machinery that was required.

Mr. M. G. PEARCE remarked that any particulars relating to the earlier history of the working of Dolcoath would be very interesting, but unfortunately they had only a very meagre and slender clue. In the year 1857, when the lord and the adventurers of the mine presented the late Capt. Charles Thomas, father of the pre-

sent manager, with a service of plate as a recognition of his long and valuable services, he, on that occasion, told them that the great master works of copper ore on the main lode was taken away during a former working, which closed in 1778, and he estimated the value of that ore at about two millions sterling. They were now at the close of 1877, and he asked them to throw their minds back to the corresponding period—100 years ago. The adventurers had long been beset with great difficulties, and with desponding hearts the resolution was passed that sealed the doom of the old lode; the pumps were to be drawn, and there was to be an end to the "old lode." There were other difficulties as well, of no ordinary character. Many of the mines were deep, and the steam-engines of that day were very different to those of the present day. The celebrated engineer Watt was then in Cornwall, introducing his steam-engines into our mines. At that time Dolcoath, according to Watt, "spent 500. per month in timber, and a new kibble rope of above 1 ton weight, worn out in a fortnight. To draw a kibble of stuff, weighing about 3 cwt., takes fully 15 minutes, owing to the great depth of the mine. If we had not furnished the mine with the most efficient means of drawing the water, almost all the deep mines would have been abandoned before now." At another time Watt wrote "Even the infidels of Dolcoath are now obliquely inquiring after our terms," and he added, "Cook's Kitchen, which communicates with Dolcoath, has been drowned out some time since." In the midst of all these calamities, with Cook's Kitchen drowned out on the one side, with Dolcoath sunk to the 160 ft. level, and the price of copper so low, was it any wonder that with such an accumulation of difficulties that the lode was "knocked off"? An interval of 20 years passed away. Parys Mountain had been pretty well exhausted, and the price of copper rose from 80s. to 100s. in 1792. In 1792 it reached 12s., and in 1799 the price had advanced to 12s. 6d. per ton. Watt, too, had succeeded in bringing the steam engine to a far greater state of perfection. All those favourable changes combined brought about a new feeling of enterprise, and another meeting was held with a very different object in view. They were a set of noble and plucky fellows who held that meeting, every man of them a Cornishman of the right sort and stamp. All honour to the memory and the names of those who came forward on that occasion and joined themselves into a body of adventurers. Well, the first stroke of the new engine was given, and the old mine was fairly afloat again, but before these efforts were crowned with success calls came thick and heavy. In these days it was thought very hard if calls were made every three or four months, but in Dolcoath the accounts were held once a month, and he found that in the year 1800 the total amount of calls was 377l. per share, or an average of 31l. 10s. per share for every successive month, so that a holder of eight shares had to pay no less than 3016l. The entire amount of calls made before the mine began to pay was 37,448l., or about 3212l. per share. All honour, he said, to the memory of such men; and they might well ask where such a body of adventurers could be found in our day. The bottom of the mine was reached in the middle of the year 1849. They commenced sinking in October of that year; the depth sunk from the year 1800 to 1849 was 54 fms., somewhat less than 7 ft. a year, and that with working the high ground and side lodes, gave employment to about 1000 persons for that long period. The late sinking of the mine 40 fms. deeper, and the driving of the 210, 220, 230, and 242 ft. levels, has resulted in the opening up of a substantial tin mine not likely to be soon exhausted, and will, doubtless, if properly managed, give employment to large numbers of people for a long period, adding to the wealth of the town of Camborne, as well as to the lode of the mine and the adventurers. Capt. Charles Thomas's estimate of the entire value of the ores raised from the commencement of its second working up to the year 1857 was three millions sterling, and this with the estimated value of its former working—two millions—made up to that period no less than five millions sterling. There had now passed away another 20 years, and he thought he was not far wrong in calculating the value of the ores raised during the past 20 years at one million and a quarter, making a total from the first to the last of six millions and a quarter. The length of the Dolcoath sett from the Stray Park to the Cook's Kitchen boundary was 568 fathoms; each fathom, therefore, of the length had yielded about 11,000l. of mineral; each foot of the length nearly 2000l. worth. Looking at it in another point of view, the six and a quarter millions was equal 1200l. worth for every week for 100 years, or 200l. for every working day during that long period. Where such another productive piece of ground was to be found in England he did not know. In Parys Mountain, from one cutting three-quarters of a mile long several hundred yards wide, and about 120 yards deep, copper to the value of five millions sterling was obtained. The Devon Great Consols produced a large quantity of mineral, probably about three and a half millions worth. He did not pretend to be well versed in agricultural estimates, but, perhaps, he was not far wrong in guessing the area of Dolcoath sett as about 300 acres. The quality of the land for grazing or corn-growing purposes would hardly be regarded either as first or second class, probably worth about 17. per acre per annum, and he imagined that the farmers who took it at a rental of 300l. a year would say, as they always did say, that they were paying far too much to get a living out of it. If the property had been sold without any reference to its mineral products they might judge it to go for 30 years value, which would be 9000l. Let them look at the deferences; the lords had received in dues, reckoning them at 1-20th, 312,500l. from this grand and venerable old mine. But it was a small matter as compared with the general benefit and blessing which the working of Dolcoath had diffused far and wide. As bearing upon the consumption of tin Mr. Pearce mentioned that the average export of tin plates for the years 1869 and 1867 were about 6200 tons per month; in 1869 the average was about 8000 tons per month; in the following four years the average was 10,027 tons per month; in the months of this year up to which time the returns had been made, despite the little business which had been done, the average exports had been 12,824 tons a month. This was double what it was in 1868 and 1867, and three times what it was in 1864. The report and accounts having been unanimously passed, and a dividend of 1074l. (3s. per share) having been declared, a cordial vote of thanks was given to Mr. F. M. Williams for presiding, and the meeting separated.

ALMADA AND TIRITO.—At the meeting of shareholders yesterday the directors' report, which was of a more favourable character than has been submitted for some time past, was adopted. A report of the proceedings will appear in next week's Journal.

TREBIGH CONSOLS.—At the special general meeting, held at the office of the company, Crosby House, on Thursday (General Tate in the chair), sundry shares were declared forfeited for non-payment of calls in arrears, and a special meeting ordered to be held on Jan. 17 to confirm the resolution. The 45 east and west is being pushed forward with all practicable speed in a very promising east and west lode in order to intersect the north and south lodes, which, from the celebrity of the district, are believed to be rich in silver-lead, and the indications generally justify the expectation of early and important results at the points of junction.

[For remainder of Meetings see to-day's Supplement.]

THE WEEK.

SATURDAY, DEC. 15.—Yesterday Flagstaffs were 1½ to 1½, but an eager seller this morning could only get 10s., and though later on there was some recovery from this, the closing price was only 9½, the official quotation being 10s. to 20s. The same quotation was given for Russia Copper, which is rather a considerable fall from last Thursday, when mention was made in this article of the critical position of the market. The London Consols showed a recovery, the price rising in request at 3½, while the rise of 6s. took place in South Carolina. There was some enquiry for Dolcoath, Carn Brea, Cook's Kitchen, and Tincoff, all of which left off better. Yesterday Egyptian United were flat, at 3½, because it was feared the coupon might be delayed. To-day, when it was known there would be delay, the bonds were firm, at 3½. The incident illustrates one of the peculiar characteristics of the Stock Exchange.

MONDAY.—Flagstaff cost buyers 1 to-day. A few transactions took place in Richmond at 9 and 9½, but the shares closed rather flat at 8½ to 8¾. The accounts received from the Port Phillip Copper Company showed the total receipts for four weeks ending Oct. 10 were close upon 5000l. Shares are 13s. to 15s., and firm. Parys Mountain sold at 1½, and North Laxey at 8. Consols of Chili offered at 1, and no buyers. South Roman Gravel, ¼ to 1½ (1½ paid); Tankerville, 4 to 4½; West Tankerville, ¼ to 1½; Rookhope, 1 to 1½; Holmshush, 1 to 1½; Llanrwst, 1½ to 2½; Lion Brewery, 17 to 17½; Tiverton Brewery, 4½ to 5; Butler's Wharf, 1 to 1½.

TUESDAY.—The leading securities from continued sales are now considerably lower than they were at the commencement of the present account. Consols left off to-day 9½, sellers, Dover, A. being only 119; Brighton, A. 115½; Camborne, 10½; Great Eastern, 49; North British, 95½. Egyptian stocks are able to maintain their price, the United now being 3½, and the Preference 53½. Erie shares, 9 to 9½; Illinois Central, 72½ to 73½; Atlantic First, 24 to 25; Credit, A. shares remain flat at 1½, sellers; and Royal Aquarium at 3, sellers. Richmond mining shares gave again, closing 8½ to 8¾; the run is 890,000. Don Pedro, 7 to 8; Aberdun, 29 to 30; North Laxey offered in considerable numbers at 7½. Buyers to-day of Flagstaffs gave 1½, but the principal movement was in Everhardt. All the morning shares could be had readily enough at 1½, and in a few instances at less than that. In the afternoon it was given out that a telegram had been received, mentioning an improvement in the tunnel. The shares went straight away to 8½, and ultimately closed 7½ to 8½. The contents of the telegram were not known during business hours. It was mentioned that the "face" in the tunnel looked favourable, and that there was 1000 tons of ore in sight. Something more than this was feared when "bears" were bidding 8½.

WEDNESDAY.—Everhardt's gave way to 7½ to 8. Speculators for a rise in railways were much disappointed by the announcement that Parliament will meet on January 17, and at one time a semi-panic prevailed, especially among the holders of Brighton, A. and Dover, A. Both these absurdly high stocks tumbled down over 2 per cent., though the last price showed some recovery. Chatham Preference suffered equally with these two. Dollar fell to 53, and Great Eastern to 45½. Russian of 1875 declined 1½ (76½ to 76½), but Egyptian kept up bravely. Grand Trunk securities were pressed for sale, and the rise at the commencement of the month has now been quite lost. The first Preference is now no higher than 50, the second being 52, and the third 17. Flagstaff, 1 to 1½. New Quebrada, 2½ to 3½. Russian Copper, 1½ to 1½. Consols, 1½ to 1½.

THURSDAY.—Railways were again pressed for sale, and left off in many instances at an important reduction. The fall would have been greater but for a favourable Bank return and a recovery in Consols. Metropolitan District, after falling ½ per cent., closed exceptionally firm at a good rise. A dividend of 6s. per share is to be paid by the Bank of Roumania; there was nothing divided last year. It is understood that the committee appointed to investigate the affairs of the Diamond Fuel Company propose filing a petition to wind up. Wye Valley, 2½ to 2½; Penruith, 5s. to 5s.; Llanrwst, 1½ to 1½. Richmond Hill 19s., closing 8 to 8½.

FRIDAY.—After the severe fall for two days, railways show a disposition to rally, which is most marked in the case of British, Camborne, and Great Eastern. Russian and Egyptian Bonds are unchanged. In mining shares Flagstaffs are weak, and offered at 1½. Everhardt can be had at 7½, and Richmond at 8½. Leadhills, 4 to 4½; Tankerville, 3½ to 4; West Tankerville, 1½ to 1½; ditto (pref.), 1½ to 1½. Wye Valley, flat, and quoted at 2½ to 3½. Haultail, 4½ to 5; Roman Gravel, 7½ to 7½; South Roman Gravel, ¼ to ¾; Grosvenor, 4½. Two o'clock. British have been as high as 87½, or 1½ better than yesterday. This is mainly owing to the large bear account open. Richmond

shares are now a little better, buyers offering 8½. Credit (A) shares have been dealt in at 1½, and the B at 1½. Hudson Bay shares are at 10½; Cook's Kitchen, 2½ to 3; Devon Consols, 3½ to 3½; Penruith, 5s. to 7s.; Hero's Hill, 8½ to 9; West Tolgus, 69 to 71; Saint Harmon, 1½ to 2; Red Rock, 2½; Van, 20 to 30; Glenroy, ½ to 1. Four o'clock. Markets close firm. Egyptian Preference are up to 54½, and the United to 33½. Richmonds have improved further, and close 8½ to 8¾. Flagstaffs are 7½ to 1, and weak. At the Wheel Grenville meeting it was found necessary to-day to make an call. Some 800 or 900 forfeited shares were recently placed at 3s. each. Llanrwst, 1½ to 2½; Chapel House Colliery, 3 to 3½; Altamir, 4½; Royal Aquarium, 2½ to 3½; Milford Dock, 2½ to 3; Lewes Chemical, 1½. BIRCHIN-LANE, Dec. 21.

THE COPPER TRADE.

At the close of October there were many indications that copper had about touched its lowest possible value, and that the period was not far distant when prices must improve; the trade in November was, however, of the most limited description, the Indian demand was much curtailed by reason of the heavy fall in exchange; and the French trade, owing to political complications in that country, may be said to have been completely suspended.

We submit our usual monthly statistics. The imports of copper into England for the first ten months of the following years were—1873, 63,370 tons; 1874, 61,574 tons; 1875, 61,267 tons; 1876, 64,915 tons; 1877, 77,343 tons. The exports for the same periods were—1873, 45,568 tons; 1874, 49,825 tons; 1875, 41,043 tons; 1876, 42,777 tons; 1877, 41,462 tons. The position from Dec. 1, 1876, to Dec. 1, 1877, was as follows:—

	Price.	Stock on hand.	Stock, including afloat and chartered.
1876—December 1	£ 76 0 0	Tons 25,802	Advised by mail only.
1877—January 1	70 10 0	25,830	Tons 31,823
February 1	73 0 0	26,518	34,228
March 1	71 0 0	26,461	36,047
April 1	71 0 0	26,563	36,833
May 1	69 0 0	26,585	35,968
June 1	69 0 0	26,342	34,844
July 1	69 0 0	26,533	35,578
August 1	69 0 0	26,503	34,313
September 1	67 0 0	26,503	35,437
October 1	63 0 0	31,823	36,239
November 1	65 10 0	31,454	36,177
December 1	63 10 0	30,701	36,861

And the comparative positions at the same date of the past four years with the present:—

	Price.	Stock.	Stock, including afloat and chartered.
1873—December 1	£ 83 0 0	Tons 29,141	Advised by mail only.
1874—December 1	87 0 0	26,572	Tons 27,028
1875—December 1	81 0 0	26,885	29,222
1876—December 1	74 0 0	25,802	31,623
1877—December 1	63 10 0	30,701	36,861

The exports from the West Coast to Sept. 30, against 38,207 tons in 1876. The charters to Nov. 30, were 39,900 tons, against 45,200 tons in 1876. *Leadenhall-street, London.* HENRY ROGERS, SOLE AGENT.

Throughout the past month there was an inactive drooping market. Chili bars touching 63½, Wallaroo 72½. The present position of the article is in many respects analogous to that in the autumn of 1876. The imports and exports for ten months, January to October, were, by the Returns of the Board of Trade:—

	Imports.	Exports.
Ore	Tons 95,082	62,587
Regulus	27,711	24,318
Copper	34,382	31,920
Foreign raw	11,687	14,442
English raw	8,550	9,790
Manufactured, including yellow metal and brass	23,711	19,667

Chili slabs had a fall of 2½ per ton since our last issue, and at 63½ a considerable quantity changed hands, the price on the West Coast admitting of bars being laid down at Liverpool at 82½. *Leadenhall-street, London.*

EXPORTS.—First eleven months. 1875—tons. 1876—tons. 1877—tons. English copper, wrought & unwrought, 21,063 22,227 20,744 Foreign copper, unwrought, 13,529 15,923 13,266 Yellow metal, 12,636 11,576 15,923

IMPORTS.—First eleven months. 1875—tons. 1876—tons. 1877—tons. Copper in ores, 7,425 10,365 13,600 Ditto, regulus, 4,230 11,898 13,554 Ditto, bars, cakes, and ingots, 39,296 35,941 37,265 In pyrites (estimated), 12,599 12,194 15,408

Total imports. 70,550 70,398 79,817 *Fenchurch-street.* GREENFELD AND RICKARDS.

Messrs. HARRINGTON, HORAN, and Co. (Liverpool).—Arrivals here during the fortnight of West Coast, S. A., produce—Liguria, 830 tons bars, 150 tons ingots. At Swansea—nil. Stocks of copper (Chilian and Bolivian) in first and second hands, likely to be available, we estimate at—

	Ores.	Regulus.	Bars.	Ingots.	Barilla.
Liverpool	1229	917	12,212	20	—
Swansea	2754	4000	1,797	—	—
Total.	3977	4917	14,009	20	—

Representing about 17,037 tons fine copper, against 17,110 tons Nov. 30; 14,207 tons Dec. 15, 1876; 12,004 tons Dec. 15, 1875; 10,500 tons Dec. 15, 1874. Stock of Chili copper in Havre, 7612 tons Dec. 15, 1875; 10,500 tons Dec. 15, 1874. Stock of Chili copper afloat and chartered for to date, 10,000 tons fine, against 12,500 tons Dec. 15, 1876; stock of foreign copper in London, chiefly Australian, 4797 tons fine, against 2410 tons Dec. 15, 1876. According to advices from Valparaiso the comparative exports of fine copper from Chili and Bolivia to all parts of the world during the first nine months of the following years were—1873, 34,342 tons; 1874, 38,328 tons; 1875, 35,385 tons; 1876, 34,380 tons; 1877, 31,000 tons; 1878, 35,057 tons; 1879, 30,770 tons; 1880, 39,688. The relative proportions per cent. of the descriptions of copper being—1877 1878 1879 1880 1881 1882 1883 1884 1885 1886 1887 1888 1889 1890 1891 1892 1893 1894 1895 1896 1897 1898 1899 1900

EXPORTS.—English copper—wrought and unwrought, 21,063 22,227 20,744 Foreign copper—unwrought, 13,529 15,923 13,266 Yellow metal, 12,636 11,576 15,923

Total. 47,219 49,728 49,933

THE TIN TRADE.

The course of our tin market during this month has been very disappointing to operators for a rise, for after another advance of 1½ ft. to 2 ft., a sudden reaction set in, prices giving way no less than 3 ft. from the highest point. The position of Banca tin in Holland on Nov. 30, according to the official returns of the Dutch Trading Company, was—

	Imports.	Exports.
Import in November	Slabs 8,985	958
Total eleven months	128,493	90,078
Deliveries in November	6,283	7,490
Total eleven months	119,765	123,633
Stock second-hand	49,417	42,511
Unsold stock	13,524	15,856
Total stock	62,939	58,367
Afloat	Peculs 5,175	7,650
Statement of Billiton:—		
Import in November	Slabs 6,564	12,200
Total eleven months	91,790	94,289
Deliveries in November	6,422	5,750
Total eleven months	81,258	93,989
Stock	41,061	24,927
Afloat	14,090	12,000
Quotation 1 Banca	41.0	45½ ft.
Nov. 30, Billiton	40	45

These combined returns of Banca and Billiton for 1877, compared with those for 1876, exhibit—An increase of the import for November of 75 tons; an increase of the import for the eleven months of 1124 tons; a decrease of the deliveries for November of 1 tons; a decrease of the deliveries for the eleven months of 518 tons; an increase of the stock second hand of 563 tons; a decrease of the unsold stock of 79 tons; an increase of the total stock of 483 tons; a decline of the quotation of Banca of 9½ p. per ton. The Government returns for the month of September are:—

	September.	October.	November.	December.
Germany	Tons 272	267	249	240
England	11	63	1	312
Belgium	135	203	312	1293
France	41	35	49	510
Hamburg	69	65	45	391
United States	16	6	—	73
Other countries	74	70	14	428
Total	608	698	454	5465

Rotterdam. EMBELING AND HAYKLAAR.

SHAFT AND AXLE BEARINGS.—The invention of Mr. A. HANDYSIDE, of Derby, relates to the bearings of shafts or axles, and consists in forming the same of papier mache moulded under pressure to the desired shape, whereby a considerable saving is effected in the cost of bearings, and the liability to the heating of the rubbing surfaces is diminished, whilst at the same time great durability is obtained.

FOREIGN MINES.

ST. JOHN DEL REY MINING COMPANY (Limited).—Advices received Nov. 30, 1877, dated Morro Velho, Nov. 9, ex Mondago. GENERAL OPERATIONS.—GOLD EXTRACTED TO DATE.—The produce extracted during the second division of October—a period of eleven days—amounts to 13,999.2 ozt. It has been derived as follows:—

	Ozts.	Tons.	Ozts. per ton.
From general mineral	5,501.5	881	= 6.244
Mineral freed from killas	5,667.0	569	= 9.9.9
Cotesworth mineral	629.0	63	= 9.984
Re-treatment, &c.	1,301.7	—	= 0.202

Total 13,999.2 ozt. 1513 = 8,739 Or (say) 13,999.2 = 1,510 1246 from 1,513 = 1,0035 per ton. An unusual amount of low-grade mineral has been treated in the above division, the greater proportion being from sections A and B 256. The removal of this belt from the expected continuation of the western improvement through section C and D 256 can be met with. To better facilitate this division of the stone has been decided upon, and the deepening of its upper part, so as to leave, if practicable, an arch of ground or support at this point.

Advices received Dec. 18, 1877, dated Morro Velho, Nov. 17, ex Neva. GENERAL OPERATIONS.—These have proceeded since last division without any interruption worthy of note. The produce for October compared with last month is less by 1617 oztavos, and the standard yield per ton nearly 1 oztavo. The above decline is due to the temporary suspension of stopping operations in the rich western sections during the stoppage previously advised, and the large quantity of poor mineral raised from sections 266 and 257.

The month's cost is higher by 641l. Included in the above are two exceptional items—yearly capitation tax and an extra payment of rewards and overtime, in all 262l. The labour cost, mine and surface, shows an excess of 802l.; an increase of force having been engaged in both construction and mine exploratory work. The exchange is ½d. higher. The output of mineral for the month is 6741 oztavos, being an increase of 823 on the previous return, 318 of which, valued at 1600 ozt., has been added to the reserve stock at surface; the total reserve amount up to the end of the month amounts to 1570 tons. Though the foregoing produce and profit is the lowest reported for the last six months, the result, on the whole, may be considered satisfactory, when the large amount of unproductive work, both in the mine and at surface, is remembered.

GOLD PRODUCE FOR THE MONTH OF OCTOBER.—The produce extracted during the above period amounts to 38,637 ozt. = 454,288 ozt. Troy. It has been derived as follows:—

From general mineral	18,484.1	from 2776 =	5.938
Mineral freed from killas	16,875.8	" 1860 =	9.007
Cotesworth mineral	1,155.0	" 149 =	7.751
By re-treatment, &c	356.7	" =	7.45
By Prala	556.0	" 112 =	4.964
Total	38,437.6	4507 =	4.802

Or (say) 36,981.6 ozt. = 445,288 ozt. Troy, from 4397 tons = 7890 ozt., equal 9094 ozt. Troy per ton.

The quantity of mineral treated is higher by 366 tons, of which 112 was of inferior quality, chiefly poor killas and quartz. The imperfect separation of the mineral, owing to the crowded state of the spalling floors, together with the unusual amount of poor mineral treated, is due to the fall in the standard yield.

COST AND PROFIT. The produce being 38,637 ozt. Deduct loss in melting 303.0 " Cost 38,334.6, at 7s. 9d. per ozt. = £14,854 13 8 5,063 13 10½

Profit. £ 6,790 19 9½ REDUCTION DEPARTMENT.—A large amount of extra work has been done; the excavation, east of Lyons, for the new stamps is completed. Additional straining area and concentrating boxes have been placed at the Praia. The Graia stamps 24 heads, have been pulled down, and the greater part thereof delivered here, and will shortly be erected to replace the Powies and Cotesworth.

MINING DEPARTMENT. Mineral raised from mine 6741 oztavos. quarried per borer per diem 184 " Average number of borer daily 132-18 " Average number of natives daily 195-23 " **SUMP AND STOPE 278A.**—The amount sunk for the month has been 4 ft. 4 in.; this is small duty, but it is as much as could be expected, considering the heavy and large amount of work consequent on the removal of lode from the south wall, and the widening of the excavation at this point. The lode in the sump and stope adjacent to same presents a favourable appearance both as regards the yield and width of the pure mineral body. With the slight increase in sinking a corresponding and larger area of stope ground is now available.

LEVEL ABOVE SUMP AND STOPE 278B.—The advance made for the month is a trifle under the last return. In the forebore there has been a slight increase in the width of the mixed body of mineral, the dividing line of killas having become towards the latter part of the month intermixed with black quartz and pyrites. In the stope below there is no change to advise; the width of the pure mineral body in this direction. The stope is within change, and has yielded the average amount of high grade stone. To admit of a still larger extraction an intermediate stope below the mouth of the level has been decided upon.

EASTERN DRIVING UNDER ROOF AND STOPE 236B.—There has been a small increase in the width of the pure mineral. The slight advance, however, consequent on the hard nature of the forebore, affords but little data as to the form of the lode in advance. The communication once made with the old Cachoeira section, a better opinion can be formed as to the probability of an extension of the mineral body in this direction. The stope is within change, and has yielded the average amount of high grade stone. To admit of a still larger extraction an intermediate stope below the mouth of the level has been decided upon.

256 B.—The extraction of poor mineral, of which a great portion has been unproductive killas, has been very large. As previously reported, this belt of poor ground is only the supposed line of the western improvement. It was at first intended to remove the entire body, but in view of the increased favourable extension in width and length of the mineral body west the greater part will now be left standing as a support or arch of ground, and an opening made on its upper part in 256 A. According to the development of the western improvement it may be found advisable to drive a large level from the horizon of 257 C, or expected line of continuation, leaving the overhanging mass as an additional support to the walls.

WESTERN SECTION, 235 C D, AND 255 B.—A marked improvement has taken place in the general condition of the above stope and westerly extension. The mineral body so far developed shows an increased width, with fair indications of strength and permanency. The average width of the pure mineral contents along the face of the stope is 28 ft., or 35 ft. in all of pure and mixed lode. In the western driving an advance of 6 ft. 6 in. has been made, with an alteration in its bearing 30° more southerly. The result has been increased mineral contents of high grade, with promise of extension and improvement.

Mining Correspondence.

In shares of foreign copper concerns Canada have advanced 20s., and Canadian 94., while Russia are 15s. lower; Tharsis, 7s. 6d.; Huntington, 4s. 6d.; and Rio Tinto 7s. per cent., &c. New Quebrada firm, on favourable report from the mines. The report from the Cape Company's mines for October, as also the sales, are satisfactory. The 5 per cent. and 7 per cent. coupons, and 7 per cent. drawn bonds of the Rio Tinto will be paid on Jan. 1. The same company publish the numbers of 107,000, of their 5 per cent. bonds, cancelled for the half year's sinking fund, making a total cancelled of 184,000. 100 tons of 20 per cent. ore has been shipped by the Yorke Peninsula Company to England, making about 500 tons during the year. The quality of the sales is also satisfactory. Progress of the work at Minas is very satisfactory, and on Morphet's lode there is untouched ground between the 20 and 20 fathom levels, estimated to contain about 3000 tons of ore. There is evidently some misapprehension in the copper market in reference to the

are glad to hear that at no period has this mine looked so well.

BRITISH MINES.

port, except that we are draining our other working, which is an advantage. I am now shipping a further parcel of lead—14 tons.

During the past week the market has been dull, as usual at this

In shares of foreign copper concerns Cape have advanced 20s., and Canadian 91., while Russia are 15s. lower; Tharsis, 7s. 6d.; Huntington, 4s. 6d.; and Rio Tinto 7s. per cent., 5s. New Quebrada firm, on favourable report from the mines. Tint report from the Cape Company's mines for October, as also the sales, are satisfactory. The market is well supplied with 20 per cent. coupons, and 10 per cent. inst. The 5 per cent. and 7 per cent. coupons, and 7 per cent. drawn bonds of the Rio Tinto will be paid on Jan. 1. The same company publish the numbers of 37,000, of their 5 per cent. bonds, cancelled for the half year's sinking fund, making a total cancelled of 164,094. 100 tons of 20 per cent. ore has been shipped by the York Peninsula Company to England, making about 500 tons during the month. The mining programme for the year is well advanced. The Rio Tinto Mine is very satisfactory, and on Morphet's lode there is untouched ground between the 20 and 30 fathom levels, estimated to contain about 3000 tons of ore. There is evidently some misapprehension in the copper market in reference to the

NOTE.—The above lists of mines and auxiliary associations are as full as can be ascertained. Scotch companies only being inserted, or those in which Scotch in-

are glad to hear that at no period has this mine looked so well.

As depth is attained the junction will be met with in the shaft, where I have no doubt great quantities of lead will be found. There is a trial shaft sunk about 40 fms. in advance of the shallow adit, where the lode is from 3 to 5 ft. wide, and of a very promising appearance, composed of fine friable spar, gossan, and good limestone. Looking at the size and appearance of the lode in the shallow level, the shaft should be sunk to a deeper level with a bare of men as quickly as possible, and the levels extended east and west, which I have not done, to open out good paying ground. The bottom or 20 fm. level should be pushed on with four men, which will leave good profit on driving, and open out good stopes. Both the deep and shallow levels should be driven with two men in each, which will more than pay the cost of driving, and lay open large sections of good stopping areas crossing the main lode north and south of a very fine and masterly appearance as depth is attained; this in all probability will have great success, and around the junction large quantities of lead ore may be expected. In looking at the deep adit level I find that from the porous nature of the lode a large proportion of the water that should be brought to surface by this adit percolates through put in this level, and takes up a considerable quantity of water, and enable us with the present wheel to sink to the next level, or until the engine is erected. I find the dressing apparatus quite inadequate to treat the large quantity of ore that we may expect, and would suggest that new and more modern be put in without delay. In conclusion, I beg to say that if the operations are carried out vigorously, and in a workmanlike manner, there can be but little doubt that you will have a good and lasting mine.

H. T. HALEY.

LEADHILLS MINES—MONTHLY REPORT.

Dec. 19.—Brow Mine: In sinking Glengaron engine-shaft from the 60 to the 70 it was noticed that a marked change in the structure and colour of the country rock took place about 65 fms. down, when the said points, and that the lode carried better defined walls and less underlie than hitherto, and the present bottom of this shaft is one of the deepest, if not the deepest point yet explored, either of the mines, the phenomena mentioned above were watched by us with a good deal of interest. In driving north in the 72 we have had a nice looking lode, well charged with sparry matter and pieces of ore, the vein in the present end giving evidence of being near productive ground. The 72, south of shaft, and the 70, north of shaft, were driven to a depth of 55 fms. to make trial along the bottom of the 60 south for the present; this ends are being driven by four men suspended the 60 south for the present; and put the 72 on to make trial along the bottom of the 48, beyond the 60 end, by four men, at 40s. per fathom, and 40s. per ton; lode worth ½ ton per fathom. The stope in bottom of the said level, north of the shaft, by four men, at 30s. per fathom, and 10s. per ton, worth 1½ ton per fathom. The stope in the bottom of the 30 north, by four men, at 40s. per fathom, and 20s. per ton, worth 1½ ton per fathom. We have started a cross-cut in the present 30 fm. level north to go east towards what we think to be the main lode, and expect to intersect in 5 to 9 fathoms driving. A cross-cut, north of the shaft, by four men, at 60s. per fathom, and 10s. per ton, in the last 4 fathoms driving 16 to 20 cwt. per fathom. Gripps' adit, north of Muir's cross-cut, north of shaft, by four men, at 60s. per fathom, and 10s. per ton; lode strong, and of a kindly character. We are looking out for an improvement here shortly. The new or No. 2 winze, below the said level, just in front of the 72, north of shaft, by four men, at 8s. per fathom for 2 fathoms stent, and 5s. per ton; present depth 5 fms. The fine through being worth 25 to 30 cwt. per fathom. The stope in back of Gripps', over the 72, by four men, at 30s. per fathom, and 20s. per ton; lode worth 25 cwt. per fathom. The stope in bottom of Gripps', south of No. 1 winze, north of shaft, by four men, at 20s. per fathom, and 20s. per ton; the lode is worth 16 cwt. per fathom. A pitch in the back of the said level, south of shaft, by five men, at 120s. per ton; men getting good wages. Muir's cross-cut to drive west towards Easty and Westy 100 and north of shaft, by four men, at 100s. per fathom.—Katine Vein: The stope in the back of the 72, south of Muir's cross-cut, by four men, at 20s. per fathom, and 10s. per ton; lode worth 6 cwt. per fathom.

Brown's Mine: The 55, to drive north of Jeffrey's shaft, by four men, at 50s. per fathom, and 10s. per ton; strong, fine lode, but at present not to value. The stope in the back of the said level, by four men, at 40s. per fathom, and 10s. per ton, worth 2½ tons per fathom. The 55, to drive south of Brown's winze, south of shaft, by four men, at 8s. per fathom, and 10s. per ton; lode worth 4 tons per fathom. The stope in the back of the said level, north of above winze, by four men, at 30s. per fathom, and 10s. per ton; lode worth 2 tons per fathom. The lode in the roof of the said level, south of Brown's winze, is worth 4 to 5 tons per fathom; hence there is now a rich section of ore ground opened here, and to the 41 fm. level 13 fathoms in height. We are leaving a good lode above the bottom of the 55 also. No. 1 stope, in back of the 41, south of shaft, by four men, at 30s. per fathom, and 20s. per ton, worth 22 cwt. per fathom. No. 2 stope south, by four men, at 30s. per fathom, and 20s. per ton; lode worth 2 cwt. per fathom. The 41, to drive north of shaft, by four men, at 100s. per fathom, and 10s. per ton; strong, fine lode, and the end is now near a run of ore seen in the 30, north of Jeffrey's shaft. A pitch in the back of the 10 north, by two men, at 100s. per ton.—Raik Vein: South of Jeffrey's cross-cut, Gripps' adit, south of the cross-cut, is suspended for the time, and the men put to cut into the east side behind the end, where a portion of the lode is standing; set to four men, at 60s. per cubic fathom, and 10s. per ton; lode worth 26 cwt. per fathom. This is quite a new feature in the lode here, and it may be of considerable importance to the mine. The stope in the back of the said level, over the 72, north of shaft, by four men, at 50s. per fathom, and 10s. per ton; lode is in two parts, in the 72, and 70, by four men, at 70s. per fathom, and 20s. per ton, worth ½ ton per fathom. The pitch in the back of the ditto, by three men, at 120s. per fathom.—Gripps' Adit, Raik Vein, Reid's Shaft: The adit to go south of shaft, by four men, at 70s. per fathom, and 6s. per ton. About 8 or 10 fms, further driving it is expected will hole Gripps' adit in Old Raik Mine, north of Jeffrey's cross-cut. We shall afterwards be able to bring the orestuff from Brow and Brown's mines through a short cut to Reid's shaft, and new dressing floors will be put in, and the mine will be able to tramming by horses underground. The stope in the back of the 10, south of No. 1, by four men, at 7s. per ton of ore; lode worth 14 tons of lead ore per fathom. The stope north of the 10, by four men, at 10s. per fathom, and 7s. per ton, worth 7 tons per fathom. The stope in the back of the 10, north of No. 3 winze, by four men, at 20s. per fathom, and 6s. per ton; lode worth 4½ to 5 tons per fathom; we are making arrangements for sinking here to a 20 fm. level. Watson's shaft from surface to go down into Old Raik Mine, by eight men at 170s. per fathom; present depth 25½ fms. 60s. per fathom, and 10s. per ton; strong, fine lode, and the end is now near a run of ore seen in the 30, north of Jeffrey's shaft. A pitch in the back of the 10, north of No. 3 winze, by four men, at 20s. per fathom, and 6s. per ton; lode worth 4½ to 5 tons per fathom; we are making arrangements for sinking here to a 20 fm. level. Watson's shaft from surface to go down into Old Raik Mine, by eight men at 170s. per fathom; present depth 25½ fms. 60s. per fathom, and 10s. per ton; strong, fine lode, and the end is now near a run of ore seen in the 30, north of Jeffrey's shaft. A pitch in the back of the 10, north of No. 3 winze, by four men, at 20s. per fathom, and 6s. per ton; lode worth 4½ to 5 tons per fathom; we are making arrangements for sinking here to a 20 fm. level. 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 and thanks were voted to Mr. Pearson Morrison and the staff. The

9s. to 11s. 6d. per ton. The report for the first division of December (eight days) at 12,000 oits., the ley of the ore being 73 oits. per ton. Don Pedro North del Rey, 3 to 3; the report for October states that the produce from 1059 tons was 4205 oits., of the value of 1877 2s. 6d., whilst the total cost, including 86 2s. 7d. expended on pumping machinery, was 2527 5s. 5d., leaving 740 10s. The produce for November was 3100 oits. Santa Barbara, 1 to 1; the manager reports that the quantity of ore raised during the month amounted to 1219 tons, of which 214 tons were rejected as refuse stone, and 1005 tons treated at the stamps. Average quantity of ore raised per borer for the month 27.5 tons.

Richmond, 3 to 8; the usual weekly telegram from Eureka gives the week's run at \$80,000 from 1030 tons of ore, with three furnaces. During the week the refinery produced \$47,000. The meeting held on Thursday is fully reported in other columns. Flagstaff, 3 to 1; the quarrelling amongst the directors continues with animation, and it is stated that shares have changed hands during the week as low as 7s. 6d. per share. Messrs. Garne and Vincent will hold a meeting on Thursday next for the general discussion of the company's position.

The latest advices from the Cottonwoods, where the Flagstaff and the Emma Mines are situated, state that never in their history, even in the flush times of 1871-2, was the prospect brighter than at present, with all its snows, perpendicular hills, and vacant residences, but with convalescent Emma. The tramway to Alta is now covered with a substantial shed from within half a mile of Wasatch to the town; it cost \$80,000 to build the snow sheds alone. At the Emma Mine there are 60 men employed, and daily shipments of ore are being made, some running up into the thousands, and most of it is high grade; this does not look as if the bottom of the great Emma Mine. The American Company has taken a long lease of the Bay City Tunnel, and proposes to develop the little Emma. At present the work is confined to the vein, but the tunnel is soon to be pushed ahead with the Burleigh drill. The Flagstaff Mine is shipping 60 tons of ore per day, assaying from \$50 to \$150 per ton, and there are 125 men employed. The tramways are completed from the mine to the railroad, and the ore is shipped in bulk, saving a great expense in sacks. It is stated that there are thousands of tons of ore in sight, and that if the company wished they could ship twice the amount.

Sierra Buttes, 1 1/2 to 1 1/2. Plumas Eureka, 2 1/2 to 3; the result of the working for November was at Sierra Buttes—Total receipts, \$10,588; total Californian expenses, including mining and milling cost, \$12,237. It is explained that owing to insufficient water supply only one-third of the usual quantity of ore was milled. At Plumas Eureka the total receipts were \$44,331, and the total Californian expenses, including mining and milling cost and new buildings, was \$20,164. London and California, 3 to 3; the Original Amador clean up for November is estimated at \$7000.

The Market for Hydraulic or Gold Washing Shares has been inactive, and prices remain unaltered. Telegraphic news received during the week mentions that steady heavy rains were falling throughout California, so that no doubt the most of the hydraulic companies are in full work. Blue Tent, 3 to 3; the superintendent reports that he has been able to start washing in the South Yuba claim with a full head. The new reservoir embankment was completed. Oregon, 4 to 4; a report of the annual meeting will be found in another column. The prospects of the undertaking are encouraging, and advices to hand since the meeting say that washing has commenced.

Hultfall, 4 1/2 to 5; the sinking of the shaft continues in a course of ore of the same value as when last reported upon. The ends in the 15 fm. level also maintain their value. The works are progressing satisfactorily.

Lead Mines have been without much quotable change, and but a small amount of business has been transacted. Van, 29 to 31; the 105 west is reported as daily improving, and the same level east is also showing spots of lead in the Bastard lode. Other parts unchanged. Caron, 2 1/2 to 2 1/2; good progress continues to be made at all points, and the lode in the 10 west is looking very promising. Red Rock, 2 to 2 1/2; the new discovery in the 60 is looking well, and other discoveries are shortly expected. Pateley Bridge, 3 1/2 to 4; the 30 east, on Rake vein, continues to open out satisfactorily, and the end is worth from 5 to 6 tons per fathom; the end is now in nearly whole ground. The 30 west is opening out good tribute ground, and other parts of the mine are producing much the same as last reported, and smelting is going on steadily. West Pateley, 2 1/2 to 2 1/2; the manager reports an important improvement in the 20, east from No. 2 shaft, and he does not hesitate to say one of the finest veins in the district; he has sometimes seen a richer in ore, but not in character—that is, matrix and minerals.

Tankerville, 4 1/2 to 4 1/2; the manager reports that the mine is looking better now than for several months past, the ends driving being worth together about 150L to 160L per fathom, and other points in operation being worth together about 140L to 150L per fathom. Leadhills, 4 1/2 to 4 1/2; the consulting engineer's monthly report on these mines states that a considerable improvement has taken place.

Subjoined are the closing quotations:—

Ashcroft, 1/2 to 1; Carn Brea, 4 1/2 to 4 1/2; Devon Great Consols, 3 to 3 1/2; Dolcoath, 3 1/2 to 3 1/2; East Caradon, 1/2 to 1/2; East Lovell, 1/2 to 1/2; East Van, 3 1/2 to 4; Glenrhy, 3 1/2 to 3 1/2; Great Lacey, 2 1/2 to 2 1/2; Hingston Down, 1/2 to 1/2; Leadhills, 4 1/2 to 4 1/2; Marke Valley, 1/2 to 1/2; Pateley Mountain, 3 1/2 to 3 1/2; Pateley Bridge, 3 1/2 to 3 1/2; Penrith, 1 1/2 to 1 1/2; Roman Gravel, 1/2 to 1/2; Rookhope, 1/2 to 1/2; Tankerville, 4 1/2 to 4 1/2; Tincroft, 1 1/2 to 1 1/2; Van, 29 to 31; West Ashcroft, 1/2 to 1/2; West Chiverton, 1 1/2 to 1 1/2; West Pateley, 2 1/2 to 2 1/2; West Tankerville, 1/2 to 1/2; Wheel Crebor, 1/2 to 1/2; Wheel Grenville, 3 to 3 1/2 (call paid); Almaden and Tinto, 1 1/2 to 1 1/2; Argentine, 2 1/2 to 2 1/2; Birdseye, 1/2 to 1/2; Blue Tent, 3 to 3; Cape Copper, 3 1/2 to 3 1/2; Cedar Creek, 1/2 to 1/2; Chontales, 1/2 to 1/2; Colorado Terrible, 1/2 to 1/2; Condes of Chili, 2 1/2 to 3; Eberhardt and Aurora, 1/2 to 1/2; Exchequer, 1/2 to 1/2; Flagstaff, 3 to 3 1/2; Frontino and Bolivia, 1/2 to 1/2; Hultfall, 1/2 to 1/2; I. & L. 1/2 to 1/2; Javali, 1/2 to 1/2; Kapanga, 1/2 to 1/2; Last Chance, 1/2 to 1/2; New Quebrada, 2 1/2 to 2 1/2; Pateley, 1/2 to 1/2; Plumas Eureka, 1/2 to 1/2; Port Phillip, 1/2 to 1/2; Richmond Consolidated, 1/2 to 1/2; St. John del Rey, 3 1/2 to 3 1/2; San Pedro, 1/2 to 1/2; Sierra Buttes, 1 1/2 to 1 1/2; South Aurora, 1/2 to 1/2; Teconia, 1/2 to 1/2; United Mexican, 2 1/2 to 2 1/2; Oregon pref., 4 to 4 1/2.

At the Truro Ticketing, on Thursday, 2851 tons of copper ore were sold, realising 9339L 5s. The particulars of the sale were—Average quantity, 96L 8s.; average produce, 6 1/2; average price per ton, 3L 5s. 6d.; quantity of fine copper, 178 tons 4 cwt. The following are the particulars:—

Date.	Tons.	Standard.	Produce.	Per ton.	Per unit.	Ore copper.
Nov. 22, 3210	87	14	0	7 1/2	£3 13 0	10s. 1d.
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Compared with the last sale, the advance has been in the standard 3L 10s., and in the price per ton of ore about 4s.

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WEST TANKERVILLE.—By the report received this week there is a splendid-looking lode in the 86 south, which has improved to 2 1/2 tons of lead ore per fathom; and the winze below the 75 is worth 1 1/2 ton per fathom.

WHEAL AGAR.—The fixing of 225 fathoms of skip-road in nine days' interruption of drawing stuff from the bottom of the mine is a feat deserving of recognition and encouragement. Capt. Moyle, during the illness of the manager, has successfully designed and carried out to completion the task he set himself to do. The old kibble is now discarded, and double the quantity of stuff can be drawn in the same time and at the same cost. When a good and strong gig has been finished the men will be able to ascend and descend without that loss of physical power and time now spent. This mine is opening out exceedingly well, and bids fair to reward the shareholders in proportion to their long perseverance. There were 166 tons of tinstone, assaying 140 lbs. of tin per ton of stuff,

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Messrs. Brooker, Dore, and Co.—IRON: There is nothing new to report as to the state of the market for Scotch or North Country pig-iron: the demand usually slackens at this time of year, and it is as much as we could expect that November's prices should have been maintained. The shipments for November show a large decrease both in value and tonnage, as compared with the corresponding month of this year. FRIEDERICK IRON: We cannot report an improvement in any one branch of the trade; but prices are now more settled, and makers almost universally refuse to make further concessions. FENCING WIRE: This department of the trade has been in a very bad state recently, but the demand for telegraph wire has been active, and seems likely to continue so. TIN-PLATES: There is no improvement in price, but demand is fairly good, and the shipments show an increase in value, notwithstanding the low prices that have been current.

WEST TANKERVILLE.—By the report received this week there is a splendid-looking lode in the 86 south, which has improved to 2 1/2 tons of lead ore per fathom; and the winze below the 75 is worth 1 1/2 ton per fathom.

WHEAL AGAR.—The fixing of 225 fathoms of skip-road in nine days' interruption of drawing stuff from the bottom of the mine is a feat deserving of recognition and encouragement. Capt. Moyle, during the illness of the manager, has successfully designed and carried out to completion the task he set himself to do. The old kibble is now discarded, and double the quantity of stuff can be drawn in the same time and at the same cost. When a good and strong gig has been finished the men will be able to ascend and descend without that loss of physical power and time now spent. This mine is opening out exceedingly well, and bids fair to reward the shareholders in proportion to their long perseverance. There were 166 tons of tinstone, assaying 140 lbs. of tin per ton of stuff,

sold for 360L 8s. 6d. on Monday last, being twice the average of the richest tinstuff of the county.

Vice-Chancellor Hall has appointed Mr. Charles Lee Nichols (Chatteris, Nichols, and Chatteris) official liquidator of the Florence Land and Public Works Company.

The Master of the Rolls has appointed Mr. H. Evans Broad (Broad, Paterson, and May) official liquidator of the Imperial Investment Association (Limited).

A petition for the winding-up of the Diamond Fuel Company is to be heard on Jan. 12 next.

Petitions have been presented to the High Court of Justice for the winding-up of the Live Stock Insurance of Great Britain, and Eclipse Gold Mining and Quartz Crushing Company.

The Colonial Bank will pay for the half-year ended June 30 last a dividend of 7 per cent. For the corresponding period in 1876, the distribution was 6 per cent.

With this week's Journal a SUPPLEMENTAL SHEET is given which contains—Original Correspondence: Tasmanian Tin Fields—No. II. (J. Mafford); Chontales Mining Company (W. Palmer); the Paraffin Decaphtalene—Great Quantities of Gold from Chilian Copper Ores (H. Bewell); New Quebrada Company; Air Compressing Machinery; Rock Drills (H. Waddington); Dolcoath, and Rock-Drilling Machinery (Le Gros, Mayne, Leaver, and Co.); the Trials of Rock Drills (Le Gros, Mayne, Leaver, and Co.); Trial of Rock-Drilling Machinery (B. L. Attwood, Government Inspector of Mines, &c.); Miners' Rights—Mr. Macdonald, M.P.; Electric Lighting—No. IV. (A. Vassard); the Limited Liability of the Coal Book (R. Tredinnick); Yorkshire Lead Mining—Pateley Bridge (R. Tredinnick); the Yorkshire Mines—Pateley Bridge Mining in Cardiganshire (O. Kneebone); Discovery of Lead Ore near Rhayader (A. Evans); Old Treburt Silver and Lead Mine; Holmbush Mine; Devon Great Consols; Great West Van Mine; Bankrupt Limited Companies; Llanrwst Mine (Granville Sharp); Llanrwst and Aberdunant Mines (H. Gould Sharp); Llanrwst Lead Mining Company (Granville Sharp); Meeting of St. John del Rey, Oregon, Tolima, Richmond, Eclipse, and San Pedro Companies, &c.

PHOSPHOR-BRONZE.—The subjoined extract from the Naval and Military Intelligence in Wednesday's Times will be of interest, not only to the shareholders in the Phosphor-Bronze Company, but to a large number of consumers:—"It has been usual to employ copper or gun-metal for the manufacture of tools used in connection with explosive materials, from the supposed inability of those metals to create a spark of fire, but experiments have recently proved that sparks can be produced by friction from both gun-metal and copper, and that the alloy known as phosphor-bronze is the least liable to that infirmity of all the materials considered suitable for the purposes required. For the future, therefore, it is ordered that all laboratory knives, scissors, needles, and other articles used in the manipulation or manufacture of gunpowder are to be made of phosphor-bronze.

MANUFACTURE OF IRON IN INDIA.—In addition to other enterprises that they have undertaken, the Indian Government have of late years directed attention to the development of the large coal and iron deposits of that country, and their efforts have now reached a stage which, if carried to a successful issue, cannot fail to be highly beneficial to India, and at the same time to have considerable influence upon trade at home. Several remarkable and important coalfields are known to exist in India, some of which are being worked by English companies. An instance which has been brought under our notice of the development of coal and iron deposits in the interior of the country is deserving of attention. Some few years ago borings were commenced at Warora, in the Central Provinces. Subsequently a shaft was sunk to a depth of about 200 yards, and the colliery is now in active operation, the output, which is limited by the market, being 140 tons per day. The most modern machinery is used, and the labour employed is that of natives, several of whom, it is stated, working side by side with other castes. The engineer is Mr. A. H. Ness, who is in the employ of the Government. Distant about 20 miles from the colliery is an immense deposit of iron ore, the quality of which is excellent, containing as it does about 71 per cent. of metallic iron. The coal found at Warora is not, however, so fine a mineral, its composition being—fixed carbon 67 per cent., volatile combustible matter 28 per cent., water 9.5 per cent., and ash 13 per cent. It very much resembles, therefore, the lignite or brown coal found in this country and elsewhere, but is somewhat superior in quality, and its colour is black. Hitherto this coal has chiefly been used in the working of locomotives upon the Indian railways, but the discovery of the iron ore directed attention to the method of its utilisation in the manufacture of iron and steel. The nature of the coal does not admit of its being used by the ordinary appliances—i.e. blast-furnaces; it is altogether too friable to bear the weight of iron ore. In order to test the question of its utility in the manufacture of iron, the Indian Government forwarded to this country about 100 tons of each mineral, and Mr. Ness caused a quantity to be sent to Mr. J. Ireland, engineer of Broughton, Manchester, who is identified with what is known as the Blair process. For some time past Mr. Ireland has been experimenting with the minerals, a furnace specially adapted for the purpose being erected upon his premises. By the process named the ore and the native coal are placed in the furnace, passed through a vertical retort and deoxidised, the result being a pure "spongy" wrought-iron. It is then, of course, in a fit state to be converted into steel, and we are assured that steel of excellent quality has been manufactured. The experiments have proved so satisfactory that the whole matter is now before the Government with the view of works being erected at Warora. Should this lead to the extension of such works in India, it is obvious that the iron and steel trades of this country will be considerably affected.

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NOTICE OF NEW ADDRESS.
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BORING AND EXCAVATING.—An improved method of boring and excavating has been invented by Messrs. MANNING and HAAS, of Stockton. A cylinder with its lower end open is taken and the edge sharpened. A little above the bottom the cylinder is divided by a diaphragm in which is an upward lifting valve. A short distance above the diaphragm is a solid diaphragm, and in the upper part of the cylinder above this diaphragm is a weight or hammer which has a length of stroke in the upper part of the cylinder, so that it can be raised and allowed to drop on the diaphragm for working it into the earth. The hammer is guided in the upper part of the cylinder, and stops prevent it from coming entirely out of the cylinder when hoisted. In operation this apparatus is suspended by a rope from the end of a derrick or hoisting apparatus, the rope being attached to the weight. The sharpened lower edge of the cylinder is then allowed to rest on the ground, and the hammer raised and dropped suddenly, and thus by a succession of blows drive the cylinder into the earth. The valve allows the air and water to pass above the diaphragm as the cylinder is driven into the earth, so that when the lower or earth chamber has been filled, the entire cylinder can be hoisted out and emptied, the water above the valve serving as a packing to keep the valve tight, and the consequent vacuum above the earth formed by the weight of material in the cylinder serving to retain the load. If the hole does not contain enough water it is supplied from the surface, for which purpose a hole is made in the diaphragm, so that when water is poured in it will pass down and rest in the valve. When the cylinder is filled the hammer is hoisted to the stops, and a further hauling on the rope hoists out the entire cylinder and load.

Notices to Correspondents.

* Much inconvenience having arisen in consequence of several of the Numbers during the past year being out of print, we recommend that the Journal should be kept on receipt; it then forms an accumulating useful work of reference.

YELLOW METAL SHEATHING.—A friend of mine being anxious to place orders for yellow metal at 64d., as quoted in last week's Journal, I should be very glad to learn who are the sellers at that price. —C. W. : Wolverhampton, Dec. 18.

NICKEL AND NICKEL ORE.—The present value of nickel is 5s. to 5s. 6d. per lb., but taken by the cwt. it is not more than 23s. to 25s.; it has been bought lower. For 10 per cent. ore (a very high produce) from 45s. to 50s. per ton can be obtained. Sellers who fail to obtain at least these prices should publish the sales made and names of purchasers (as is done with tin and lead), and in six months the price of ore will increase 50 per cent. —A. SELLER at 425 PER CWT.

ROCK DRILL.—“W. D.” (Lombard street).—The essential feature of novelty in the invention of Mr. Uriah Cummings, of Buffalo, is the peculiar construction of the clutch head with ratchet-teeth on its upper end in combination with a pawl, so arranged on the frame that the drill rod will receive intermittent rotary movement during its ascending strokes. The mere production of rotation by the back stroke would not constitute a novelty.

PENNERLEY.—Can any reader inform me what has become of the Pennerley Mine? Is it wound up, or is it likely to go on again? Perhaps the secretary will kindly reply through the medium of the Journal to the above. —A. SHAREHOLDER.

COMPRESSED FUEL.—Can any correspondent inform me whether the Diamond Fuel Company are really in operation, and if so what progress is being made. I am aware that the shares continue to be quoted, but as I never hear of the fuel in the market I should be glad of particulars. —CARBON.

MULTIPLYING HOISTS.—It was mentioned some time since in the Journal that an improved system of multiplying hoist had been invented, but by whom I cannot remember, the arrangement being that the lifting rope passes over several pulleys, half on one spindle and half on another, so that by separating the spindles (say 1 foot the cage rises 5, 10, or 20 feet, as may be arranged. Could not this system be applied in mine shafts so as to increase the safety of winding? Perhaps the inventor, should he see this enquiry, could give some information on the point. —R. O.

SHARE DEALING.—We never interfere in the sale or purchase of shares; neither do we recommend any particular mine for investment or speculation, or broke through whom business should be transacted. The addresses of most of the latter appear in our advertising columns.

Received.—W. Weston (Colorado): Next week—“C. S. R.” (Alma, Colorado)—“F. E. S.” (New York, Dec. 7): We are endeavouring to procure the information required, and will then write—“B. R.”—“Shareholder” (Penrith)—“Constant Reader” (Bath)—“A. T.” (Parrington): Next week—“M. C.” (Yarmouth): The idea is a good one, but would be very difficult to carry out. —A. R. Chisom (New York): The description of the Globe Rock Drill shall appear in next week's Journal—“G. J. G.” (Saxony)—“Shareholder” (Flagstaff)—“E. A.” (Flagstaff)—“Shareholder” (Richmond).

IMPORTANT NOTICE.—REDUCTION OF POSTAGE ON THE “MINING JOURNAL.”—In consequence of the new POSTAL CONVENTION, which came into operation on July 1, the postage of the Mining Journal to many countries will be reduced to one-fourth. Henceforth the subscription will be 1s. 10s. 4d. per annum (39 frs.), postage included, for the following countries. The amount will, if desired, be collected at the subscriber's residence at the end of each year. The subscription continues until countermanded:—Austria, France, Belgium, Denmark (including Iceland and the Faroe Islands), Egypt, Germany, Gibraltar, Greece, Heligoland, Italy, Luxemburg, Netherlands, Norway, Portugal (including Madeira and the Azores), Roumania, Russia, Serbia, Sweden, Switzerland, United States, Malta, Turkey, Morocco, Tunis, and the Canary Islands. Spain 1s. 19s. (50 frs.)

THE MINING JOURNAL.

Railway and Commercial Gazette.

LONDON, DECEMBER 22, 1877.

COLLIERIES, AND COMMON RIGHTS.

During the last two or three weeks Leeds and the neighbourhood have been the scenes of some unusual and excited gatherings, principally at the instance of the now well-known Mr. DE MORGAN, who has constituted himself the champion of all commoners who may consider that their rights and privileges have been infringed upon by lords of manors or others who have had lands allotted to them under various Enclosure Acts. So far as we can learn, Mr. DE MORGAN has not been particularly successful in his past efforts, for he has managed to get a good many persons into trouble in carrying out his views in a practical manner, whilst he has by his too active zeal sacrificed his liberty at the shrine of popularity, for immediately after addressing a meeting at Leeds on Saturday afternoon last he was taken into custody for contempt of the Court of Chancery by breaking an undertaking entered into by him in July last not to incite any persons to trespass upon certain lands at Selsdon Common, in Nottinghamshire, allotted in 1865 to Earl COWPER. The most recent affair, however, in which he has taken a prominent part—that at Leeds—is entirely different to all others with which his name has been associated. It is one in which it is sought to compel the owners of a colliery near to Leeds to sell the produce of it to the inhabitants at a certain price, which is now about half the present rate, although 50 years or more ago it could have been done and left a very fair profit. But things are changed since then, although the Act of Parliament may be still in force in consequence of being overlooked. Be that as it may, it is now claimed that the owners of the colliery alluded to are obliged to sell their coal at a very serious loss to them, in consequence of a right given to the original owners to have a wagonway across what is known as Hunslet Moor, leading from the colliery to the town of Leeds. The wagonway is now a railway, and the coal is taken along it by locomotives, to the advantage alike of the company who own the colliery and the inhabitants of the town who consume it. But the latter now set up a right which has fallen into desuetude, but has been raked up by some enterprising enquirer into the rights of the public, who has found that by certain Acts of Parliament passed in 1758, 1719, 1793, and the earlier part of the present century, the owners of the colliery for the time being for the common right given to them were obliged to furnish the lieges of Leeds with coal at a rate no higher than 7s. per ton. We need scarcely say that to do so now would be simply ruinous, so that it would be better to have the colliery closed altogether. The history of the whole affair is a rather singular and interesting one, and shows how careful those persons should be who by private Acts of Parliament look to the present as likely to be the rule in the future.

So far back as 1758 an Act was passed for establishing agreements made by Mr. CHARLES BRANDLING and other persons, proprietors of lands, for laying down a wagonway in order for the better supplying of the town and neighbourhood of Leeds with coals. Mr. BRANDLING was lord of the Manor of Middleton, and he opened out what is now known as the Middleton Colliery, with reference to which the action we have alluded to has recently been taken. For the right of going across the moor he engaged to furnish the inhabitants with coal for their necessary consumption at the rate of 43d. a corrie, containing about 210 lbs., which would be about 4s. 2d. per ton. This was to be continued for the term of 60 years, or so long as the mines should be used and worked, whilst the owner covenanted to convey at his own expense every year 20,000 dozen, or 240,000 corries of coal at the least, and store them up in a certain open space in Leeds in order to be there sold and delivered at the price named. In addition to this the owner agreed to pay a rent for the lands through which the carriage-road passed, but right of road was to be void in the event of the owner not carrying out his part of the contract with respect to supplying the quantity of coal named at the price. The agreement appears to have been satisfactorily carried out for at least 20 years, and in 1779 another Act was passed for establishing agreements between the owner of the Middleton Colliery and other persons, proprietors of land, for laying down a wagonway, and for supplying annually a large quantity of coal to the town of Leeds and neighbourhood. The town and district having evidently to depend on Middleton for the supplies of coal, and having greatly increased in the 20 years, the lease agreed for the next 60 years or more to deliver in the town 480,000 corries of coal at the least at the rate of 54d. for every 210 lbs. From this it would appear that the price of coal underwent but little change during 20 years, which is certainly a singular circumstance looked at in the light of the present century. This Act, however, was much stronger than the previous one, for in the event of the lessee or any future owner or servant refusing to deliver the coal or giving undue

priority they were to forfeit any sum not exceeding 40s., nor less than 5s., one moiety to go to the person informing, and the other to the poor of the township; in the event of not paying the party or parties were to be committed to Wakefield Goal for any time not exceeding a month, nor less than seven days. Things went on all right evidently until 1793, when an Act to amend the two previous ones was passed, and, like the others, was stated to be for the better supplying of the town and neighbourhood of Leeds with coals. Here, however, we note several interesting changes, for we are told that the inhabitants are very well satisfied, and convinced that on account of the advanced price of labour and of the materials used in and about coal works, the 54d. allowed by the previous Act was not sufficient. It was consequently agreed that the sum to be paid for the coal should be 13s. 1d. for every wagon of 24 corries of 210 lbs. each, which would be about 5s. 10d. per ton. At this time the district appears to have extended very much, and new works established, and so greatly had the consumption increased that a proviso was inserted in the Act that the town and parish of Leeds only should be supplied from Middleton, and any persons who sent any away outside was liable to a penalty of 40s. And here for the first time we have any notice of strikes on the part of miners, which must then have been as great a novelty as is the contrary now, for the annual quantity to be delivered in the town was still to be 480,000 corries, “unless hindered and prevented by fire or water, or the sticking out or refusal of the miners, pitmen, or colliers to work.”

Another Act relating to the Middleton Colliery was passed in 1803, and this was also stated to be for the better supplying of the town of Leeds with coal. At this period the price of coal had advanced, and the previous Acts having been repealed the one which the inhabitants of Leeds assert is still in force provided that the price of coal should be 16s. per wagon load, or about 7s. per ton, the price at which the company is now asked to supply the town. By the Act the daily supply is fixed at 1920 corries, whilst a superintendent was to be appointed to look after the coal. In the event of the Act not being complied with by the owner or owners the agreement was to be void, when it is declared lawful for him or them to take away the materials of the wagonway and put the ground in the state it was originally. Such are the main facts connected with one of the most singular mining cases that has cropped up of late years. The right of the commoners has been waimly taken up, and for the purpose of testing one of the rails was forcibly taken up a few days since, whilst the owner of a house, part of which is said to encroach on the moor, has had notice to remove it. The Middleton Company have also had two months given them to take up the rails and clear away everything. So far the company does not appear to have taken any step to prosecute Mr. DE MORGAN or anyone else, or joined issue in any way to prove their right to the use of the wagon-road across the Moor without supplying a certain quantity of coal to the inhabitants of Leeds at the price of 7s. per ton. Now, as the Middleton Main coal in the Leeds district varies from 2 to 5 ft. in thickness, it is clear that it would be impossible to deliver it at any depot in the town at 7s. per ton, therefore if the Act is really binding the company would be unable to carry it out, and, as we have before stated, had better give up working the colliery if they can do so, at least so far as supplying the town is concerned. Should they do so, then the determination of the commoners to have their “pound of flesh” would be more of a loss to them than otherwise. The company may, however, take steps to have the Act, if it is really binding, repealed during the next session, a course which would meet with a good deal of opposition. The case, however, shows what alterations have taken place during the last 100 years in coal mining, and the impossibility of anticipating the changes that are likely to take place with respect to it in the course of half-a-century, or even a great deal less.

THE BUYING AND SELLING OF MINES.

A case of more than ordinary interest, and which occupied seven days in hearing, took place recently in the Chancery Division of the High Court of Justice before Vice-Chancellor BACON, which forcibly reminds one of some of the trials which have taken place during the last two years with respect to the getting up of companies for the working of mines of very doubtful value, and for which heavy prices were paid. The case alluded to was the Boythorpe Colliery Company v. W. S. BLACK and C. BLACK Brothers. The defendants were directors of the Boythorpe Colliery Company, whose works are near to Chesterfield; and in the month of January, 1873, the owner of the Renishaw Colliery, which is also in Derbyshire, offered to sell it to Mr. Smith, the secretary of the Boythorpe Company, for 65,000l., which was declined. In July of the same year the defendants purchased it for 53,000l. They then offered to sell it to the Boythorpe Company for 120,000l., and ultimately disposed of it to the directors acting for the shareholders for 100,000l. The vendors, however, paid to Mr. SMITH, the secretary, 3500l. for what was termed “brokerage” whatever that meant, for there was no work to be done by the recipient during the transfer. On its becoming known to the plaintiffs that so large a profit was made by the Messrs. BLACK they took legal proceedings to recover the difference between what was paid by the defendants for the colliery and what they sold it to the Boythorpe Company for, on the ground that the defendants stood in a fiduciary relation to the latter as directors. For the plaintiffs it was contended that the defendants as directors and trustees were bound to treat the company with every confidence, and to disclose in the most ample manner the exact position they stood in with reference to the transaction in which they had induced the company to enter. It was also held that they should have made full and ample disclosures as to their purchase, and that not having done so the defendants were brought within the scope of recent decisions. One of the witnesses who had some shares allotted to him in the new venture said that if he had known that the BLACKS had given only 53,000l. for the colliery he would not have taken up the extra shares allotted to him, and would not have spent a shilling in the company as newly formed. But one of the most extraordinary incidents that came out at the trial was the evidence given by Mr. HEDLEY, mining engineer, of Derby, who was examined on the part of the defendants. He said he received instructions from Mr. SMITH, the secretary of the Boythorpe Company, to go down and value the Renishaw Colliery. He did so, and valued it at 173,750l. He also said that he had an extensive business as a mine valuer.

This certainly appears to us to be a most extraordinary statement to make under the circumstances, and to speak of it in the lightest terms proved to be incorrect, the colliery not evidently being worth much more than what was given for it by Messrs. BLACK, and the company found out after working it that they had made a very bad bargain. By what system of valuing such a high sum should have been placed on the colliery we are at a loss to conceive. It shows, however, that the most experienced experts in the valuing of mining property are liable to make mistakes sometimes. It was urged on the part of the defendants that there was no concealment whatever, and that they had disclosed as much as they were bound to do. Not only so, but they could have done better than sell to the Boythorpe Company, for such was the rage on the part of the public at the time to invest in colliery property that a company could easily have been formed to purchase the Renishaw Colliery from the Messrs. BLACK at a much higher price than was paid by the Boythorpe Company. The Solicitor General for the plaintiffs in replying on the whole case submitted that a decree must be given in his favour, as it was seen that the Brothers BLACK did conceal from the directors and the company what they had paid for the company, and did secretly divide between them the profit realised on the transaction. Vice-Chancellor BACON in delivering judgment held that the Messrs. BLACK had made full disclosures to the board of directors and the shareholders of the Boythorpe Colliery, and that the purchase was made after due investigation and consideration. Having been in possession of the company for two years the colliery turned out unprofitable, and had it not been that the price of coals in the various markets had fallen very much the company, in his lordship's opinion, would not have brought the action. Judgment was, therefore, given for the defendants. This result was unexpected by the company and many of those who heard the case. There is, therefore, very

little doubt but what there will be an appeal from the decision, as has recently been the case successfully with several of the judgments given by Vice-Chancellor BACON.

OUR RAILS ABROAD.

Although these are undoubtedly dull times, it is not unsatisfactory to note that the external demand for our rails has somewhat improved this year. The exports of our steel rails have especially experienced a rather important expansion, showing that the value of this description of rails is more and more appreciated. Even the United States, in spite of the remarkable development of American metallurgical industry since 1870, and in spite, too, of the severe protective tariff imposed by Congress, have been fair to take our steel rails to the extent of 404 tons this year. Russia has been a large purchaser of our steel rails this year, having taken 71,252 tons to Nov. 30, as compared with 62,458 tons in the corresponding period of 1876. Steel rails are much more calculated to resist the severe climate of Russia than iron rails, and that the Russians have come to this conclusion is evidenced by the fact that for every 17 tons of steel rails which we have sent them this year, they only took 1 ton of iron rails. It may be interesting to illustrate this by the severe short table showing the exports of iron and steel rails to Russia during the first eleven months of the last two years:—

RAILS EXPORTED TO RUSSIA.

	1876.	1877.
Iron	12,935	4,238
Steel	62,458	71,252
Total	75,393	75,490

The exports will be seen to have been of about the same extent during each of the two years, but the proportion of iron to steel rails exported has sunk from 1 in 5 tons to 1 in 17 tons, and the Russian demand for our iron rails would thus appear to be practically disappearing altogether. A somewhat similar result is observable if we institute a similar comparison with regard to the shipment of our rails to British India:—

RAILS EXPORTED TO BRITISH INDIA.

	1876.	1877.
Iron	30,404	19,112
Steel	9,973	25,822
Total	40,377	44,934

The proportions sustained by the iron and steel rails exported will be seen to have been completely reversed during the last two years, the exports of iron rails having fallen off some 33 per cent., while those of steel rails have expanded nearly three-fold. It is, however, rather curious to notice that iron rails have more than held their own this year in the Australian colonies, although the consumption of steel rails in those dependencies has at the same time also increased. We have recourse to figures again to illustrate this observation:—

RAILS EXPORTED TO AUSTRALASIA.

	1876.	1877.
Iron	10,318	43,491
Steel	10,291	23,945
Total	20,609	67,437

Present cheapness would appear to be the great point aimed at in the construction of railways in the Australasian colonies; at any rate, iron rails are in more request in that quarter than in any other market. We may fairly question whether it is true and real economy in the construction of railways to aim at cheapness before every other consideration; but we must take the world as we find it, Australia included. It must also be borne in mind that when rails have to be imported—as they have to be imported by the Australians—a prodigious distance they cost a good deal, whether they are classed as iron or steel.

Hitherto we have dealt only in special illustrations based on the experience of some one country; but if we now proceed to sum matters up from a general stand-point we are forced to the conclusion that iron rails are being more and more superseded by steel rails. Thus in the 11 months ending Nov. 30 this year iron rails were exported from this country to the aggregate extent of 165,214 tons, as compared with 182,240 tons in the corresponding period of 1876. On the other hand, 217,426 tons of steel rails were exported from this country to Nov. 30 this year, the corresponding exports in the corresponding period of 1876 coming out at the much smaller total of 161,388 tons. The metallurgical interest of Great Britain has been endeavouring to adapt itself to the altered circumstances of the times; and who can say that in doing so it has not been wise in its generation?

TONITE.—We understand that the Trinity House have adopted tonite, or cotton powder, as a sound signal to warn vessels approaching the coast in thick weather. This powerful explosive will be used in conjunction with rockets, which at a high elevation will cause the tonite charge to explode, when a loud report will follow that may be distinctly heard for miles around. During fog and in thick weather these rockets with tonite bursters will be discharged every ten minutes. This convenient, safe, and powerful explosive will doubtless be adopted by foreign Governments for the same purpose, it being more convenient, as well as more efficient, for sound signals than the guns now in use, there being a saving in weight and bulk over gunpowder, and the sound proceeding from an elevated position, instead of from near the sea level, is more widely radiated. It is also proposed to use this explosive for war rockets, where its destructive force would gain for it a wide spread notoriety.

THE COAL TRADE IN AMERICA.—A letter from Philadelphia (Dec. 18) says:—At a meeting of all the anthracite coal producing companies in New York to-day a plan was agreed upon for limiting the production of coal next year by allotting each company a quota, and imposing a penalty of \$14 per ton for exceeding this proportion. A committee was appointed to allot quotas to each company, and also to perfect the details, reporting to an adjourned meeting on the 27th inst. Nearly all the coal companies have raised their prices in anticipation of the effect of this agreement.

COAL AND IRON IN THE UNITED STATES.—The Philadelphia market for steel rails has been rather quieter during the last few days, but there is a stronger feeling, and offers which would have been accepted a week or two since would probably be declined now. The mills have generally sufficient orders on hand to carry them through the winter; orders for small lots are dropping in from time to time, and these, with the contracts already on hand, keep the mills fairly employed. Recent sales have been made at from \$14 to \$14 1/2 per ton currency at the mills. A sale of 10,000 tons has been closed at \$14 1/2 per ton currency at the mills. The Philadelphia market for iron rails has been somewhat irregular, but the general feeling is now one of greater firmness, based upon the amount of business already on hand, and the prospect of an improving demand. The Philadelphia market for pig iron has ruled dull and quiet. As regards plates and tank iron, the general condition of the Philadelphia market is not regarded as satisfactory. There has been little or no change in sheet iron at Philadelphia. Business in bar iron has been generally dull and unsatisfactory. The New York coal market has been fairly active; the demand has been pretty equally distributed between domestic and manufacturing qualities. The total movement of coal and coke over the Pennsylvania Railroad to Nov. 14 was 4,190,539 tons; of this total 3,398,197 tons were coal.

MACHINERY FOR CUTTING STONE.—A simple and effective arrangement of machinery for cutting or reducing stone and similar materials consists in employing what may be termed a cycloidal rocker, which rocking from side to side across the direction in which the stone is made to progress through the machine, cuts down or reduces the stone surface by the rolling-crushing action of one or more knives or cutters, without any sawing or rubbing process, has been invented by Messrs. Young and Thomson, of Glasgow. The cycloidal rocker, which is of an approximately triangular form, is guided at three points; one point to which the knife edge is made concentric, or nearly so, is guided in a straight guide parallel to the surface of the stone, and the other two points are guided in guides

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REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

Dec. 20.—The condition of the coal and raw and finished iron trades is unaltered upon the week. All three remain very dull. The existing variations in the prices of finished iron is a conspicuous feature just now, and the retail trade that is doing is finding its way to the merchants, for merchants' quotations, though not for the same brand, yet for a quality hardly inferior, are 10s. below those of certain ironmasters.

There is much unemployed labour in this district. It is mostly of the class required at the pits, and about the blast-furnaces and the canals. The suffering in the localities inhabited by these people is severe; it has not been worse for some years. Happily there is a good demand for employees at the hardware factories, where the labour of young people can be utilised, and families saved from being altogether unemployed. The local Unions are all overcrowded, and the guardians in Wolverhampton, in order to find an excuse for giving relief to able-bodied men, have determined to open their stoneyard, a step which has not been taken for some years. The distress occasioned in Warwickshire by want of trade at the collieries there is increased by a great lack of work at the ribbon factories.

Delegates representing the ironworkers of South Staffordshire and East Worcestershire met at Wednesbury on Monday to elect for the ensuing year the 12 operative representatives on the board of arbitration and conciliation. Mr. Capper, the men's secretary on the board, stated that in his opinion the last four years constituted the most trying epoch that had been known in the history of the Staffordshire iron trade. Never, probably, during forty years past had the ironworkers suffered such privation. The men since 1873 had submitted to reductions amounting to 47½ per cent., and he hoped the masters would make concessions in due time when trade revived. The object for which the meeting had been called was subsequently carried out.

No transactions in coal or iron properties are reported on the Birmingham Stock Exchange. Sellers in the Cannock and Huntingdon Company are at 7½ dis., in the Spon Lane Colliery at 6 dis., in the Walsall Wood Colliery at 2½ dis., in the Darlaston Coal and Iron Company at 7½ dis., and in the Pelsall Coal and Iron Company at 9 dis. At these figures no buyers are in the market for any of the properties. The original shares of the Sandwell Park Company are quoted by holders at 7½ prem., and the new shares, half paid, at 6½ prem. Buyers hold off for easier terms. Buyers of Muntz's Metal shares offer 2½ prem., but unsuccessfully. The shares of the Patent Nut and Bolt Company have sold since my last at 6½ prem., and those of the Patent Shaft and Axle Company at 1-16th dis.

The sole new feature in connection with the North Staffordshire industries is that the Rector of Longton (the Rev. Adam Clarke) has used his influence to call together the coalmasters and the colliers of Longton, with a view of a termination of the present strike in that locality. The only course unanimously agreed upon, however, has been that both sides should meet together, and discuss any basis of accommodation which may be brought forward at any future time.

Some attention is now being directed to the invention of Mr. James Barnett, of Birmingham, which consists in a peculiar method of using salt in the puddling process. The use of salt is, of course, old, but the patentable part of Mr. Barnett's invention is the method of distributing it in the charge, so that every portion shall be submitted to its influence. He very truly says that his statements can be readily tested, and he remarks:—

Give me a furnace and some iron to puddle, of a nature requiring two or three scrap balls per turn; I will use no scrap at all, but a pennyworth of salt, each scrap ball costing about 3s. per ton of iron made. I will put another pennyworth of salt into the fettling, and not only save 4-10ths, but get the iron out of it, and add to the yield; and I then produce such a quantity of iron that if I be driven abroad with my patent, because the English masters combine to starve me out, which they have done up to the present time—the combining, not the starving—they will be forced to "submit or resign" their trade to France, Belgium, and America; for my brand upon iron will be as absolute a guarantee of its quality as the Hall mark of the Goldsmiths' Company is upon jewellery.

REPORT FROM CORNWALL.

Dec. 20.—There is very little to say this week beyond the cheering fact that there has been an improvement in the price of tin, and, consequently, in the price of our mine shares, which shows a very natural and a very ready sympathy. Next week there will hardly be anything doing. Distress or no distress Christmas will be kept, and that right heartily, for it is one of the features in Cornish mining life of the present day that come weal or come woe there shall be plenty of holidays. It is not at all easy to understand in many cases where the money comes from, and less easy almost now than even when the distress committees are finding out that there are many people in want. Of course it is true of Cornwall as it is of every other part of the kingdom—we might go further and say every other part of the world—that when you have money to give away you will always find people to take it—some deserving and others only ready. And so moderate and judicious relief may be well bestowed outside the rate-aided class in Cornwall, but it is abundantly clear that great caution will have to be exercised to prevent imposition, and that the need is by no means either so wide spread or so exceptional as some good folks, whose sympathies run ahead of their common sense and their discretion, loudly proclaimed. And now that an organised effort is being made the best course will be for those who are charitably disposed to work with and through the central and local committees.

Dolcoath has declared another dividend of 5s., and we are indebted to Mr. Mark Guy Pearse, the largest adventurer, for some very interesting particulars of the history of this remarkable old mine—first started no one knows how many centuries ago, and now richer than ever. A century since it was a copper mine, and a rich one, under the name of Buller Garden, but the standard for copper fell, and hence in 1783 the mine was stopped. Probably then it did not much exceed 80 fms. in depth. But with the decrease of the stocks, the price of copper rose, the steam-engine had been brought to a far greater state of perfection, and a meeting was held at which it was decided to re-work the mine, the prominent supporter being Lord Dunstanville, the lord of the soil, he taking an eighth part of the shares. Such liberality met with its own reward. Calculating at a royalty of 1-20th from the commencement of this second working up to the present time, more than 300,000£ has been paid in dues to the lords of Dolcoath. After the old mine was fairly afloat, before the efforts to re-work it were crowned with success, calls came thick and heavy. In these days it was thought very hard if calls were made every three or four months, but in Dolcoath the accounts were held once a month, and in the year 1800 the total amount of calls was 377£ per share, or an average of 31£ 10s. per share for every successive month, so that a holder of eight shares had to pay no less than 3016£. The entire amount of calls made before the mine began to pay was 37,446£, or about 624£ per share. Again the mine proved rich, but again then came a time of depression, and most people who had to do with the mine held that it was so far exhausted in depth that its days were at an end. The copper which it had produced in such enormous quantities was nearly all gone, and the idea that a copper mine should be developed into a tin mine in depth was then entirely a novelty. With the single exception of the late manager, Capt. Charles Thomas, nobody had any confidence that the mine, so deep, could ever be made to pay as a tin mine. Accordingly, the pumps were drawn up from the 210 to the 160; the valley,

or eastern part of the mine, was crushed together and abandoned; all the marks of dissolution were manifest, the mine was to linger on a few more years, and was then to die a natural death from decay and exhaustion. That was not Capt. Thomas's opinion of the bottom of the mine, and shortly after he was appointed manager he had authority to commence drawing out the water from the deeper levels, and to clear up the valley part. The bottom of the mine was reached in the middle of the year 1849, and the sinking of the mine 40 fms. deeper, and the driving of the 210, 220, 230, and 242 fm. levels resulted in opening up a substantial tin mine not to be soon exhausted. Charles Thomas's estimate of the entire value of the ores raised from the commencement of its second working up to 1857 was 3,000,000£, and this, with the estimated value of its former working—2,000,000£—made up to that period no less than 5,000,000£. The value of the ore raised in the past 20 years was 1,250,000£, making from first to last 6,250,000£. The length of Dolcoath sett from Stray Park to the Cook's Kitchen boundary was 568 fms., so that each fathom of the length had yielded about 11,000£ worth of mineral, and each foot nearly 2000£ worth. The 6,250,000£ worth of ore realised was equal to 1200£ worth per week for 100 years, or 200£ for every working day during that very long period. Mr. Pearse rightly said he did not know where such another piece of productive ground was to be found in England. In Parys Mountain, from one cutting ¾ mile long, several hundred yards wide, and about 120 yards deep, 5,000,000£ worth of copper had been raised. The Devon Great Consols had produced probably about 3,500,000£ worth of mineral. For agricultural purposes Dolcoath sett would, probably, have let for 300£ a year, yet in dues at 1-20th the lords had received 312,500£ from that grand and venerable old mine, but even that was a small matter compared with the general benefit and blessing which had resulted from the working of Dolcoath.

It is not a very gracious thing to criticise the action of a gentleman who has in so many ways shown himself one of the truest friends to mining Cornwall ever had as Mr. Basset, and we must presume he has good reason for refusing to help Dolcoath in the matter of boring machinery. But the refusal does look very much like the penalty the adventurers have to pay for good management. If they were in difficulties we may presume that Mr. Basset would help them, but because they have husbanded their resources and kept straight they do not get his aid. Something may also be said in favour of the mine which pioneered the way with the boring machinery of the future. But is this where the reason really lies? Is it because Mr. Basset believes so thoroughly in the Beaumont boring machine that he declines to assist a mine which has not adopted it. No doubt the Beaumont borer does its work well, but a monopoly of machine boring in the hands of one company would be in the end as great an evil as the absence of boring machinery altogether, and even at the sacrifice of a little money it is best that the independence of the various mines should be preserved. To all appearance we are now as far as ever from the authoritative competitive trial of boring machines talked of when Mr. Basset originated his spirited scheme, which has dwindled into the payment of a premium to the Beaumont apparatus. Unquestionably the result is valuable, and the Beaumont has been most successful, but it is not the result that was looked for. We hoped for wider issues.

TRADE OF THE TYNE AND WEAR.

Dec. 19.—There is little improvement in the Coal and Iron Trades. A glance at the total exports of the Tyne for 11 months ending Nov. 30, 1876, and for the same period in 1877, shows that during that period there has been a falling off of upwards of 500,000 tons, or 8 per cent. We can form some idea, for the data gives what the capabilities of the coal mines of the district are, as a very considerable number of the works have not exceeded half the output they are capable of producing, and a very considerable number of works are closed altogether. Unless the demand for coal increases very considerably it is evident that several more mines must be closed. If this state of matters has not been caused it has certainly been much intensified by the impetus given to the production of coal during 1873, and following years. The total falling off in the exports is not large, but we must bear in mind that previous to this the exports were constantly increasing.

The stoppage of the Northumberland collieries has occupied most attention this week, the number of works stopped connected with the Coalowners Association amount to 35, and 30 collieries still continue to work; but it must be noticed that the works stopped include most of the large works and the largest portion of men. How long the struggle may continue is, of course, merely a conjecture if it is not settled at the end of this week by a compromise it may possibly continue until the spring trade opens, when there will certainly be a demand for steam coal. The general opinion appears to be that the men cannot stand out long, but this depends upon the support they may receive from those employed at the collieries in this and other districts; as the masters have refused to refer the matter to arbitration the men will receive liberal support, it being considered that it amounts to a lock-out. The Northumberland miners are a fine race of men, and it is to be regretted that this should occur, but the state of the trade clearly demands large reductions in the wages. Should the masters flinch in the least from the hard and fast line they have drawn we believe that a compromise might be effected.

We noticed lately the introduction of a locomotive worked with compressed air for hauling in one of the collieries of Earl Durham. It appears that a new winning has lately been made there, and the coal is lying to the dip at a considerable angle, this dip being too great to allow the economical haulage of it by ponies. These locomotives will, however, effect this, and we may expect the general introduction of these engines for hauling underground shortly.

REPORT FROM DERBYSHIRE AND YORKSHIRE.

Dec. 20.—In coal and iron, so far as Derbyshire is concerned, there has been no alteration of note worth stating, for matters for some time past have gone on in a routine manner. Quietness still prevails at the ironworks, but it is expected that the new year will see inaugurated a better state of things than has prevailed for a considerable time past. The business doing in pig has been moderate, and prices low, and it would appear that the point has been reached that any change must be one for the better. In house coal there has been a steady output, but not sufficiently so as to keep the collieries fully going, so that many of them are not working more than four days a week. The London trade has kept up very well, and at Clay Cross, Langley Mill, and other places the output has considerably increased, but there has been no alteration in the price, which is just the same as it was in the height of summer. Not so much is being done in steam coal, excepting for the carrying out of contracts for the supply of railway companies, whilst the enquiry for other sorts is very moderate indeed, competition between different districts being as lively as ever. Some branches of the Sheffield trade have become more active, and "Ball Week"—the one before Christmas—has been much better than many anticipated it would be a month ago, for there has been a fair amount of overtime during the last few days. Cutlers have become much brisker both for the home and other markets, and makers of Bessemer rails are still busy, and are likely to continue so for some time to come. There has been a slight improvement in cast-steel for cutlery and other purposes, as well as in some descriptions of foundry material. The trials made at Portsmouth with steel and iron combined to test their tenacity and resisting power against heavy projectiles show that a change is likely to be effected in the material for our iron clad, and that in all probability plates of iron entirely will be dispensed with. It is said that at Northfield work will be resumed early in the new year, which it is to be hoped will turn out to be the case. Outside the town the works appear to be very fairly employed, some of the foundries being decidedly better off.

At the Dodsworth Silkestone Colliery the men are still out on strike, but it is by no means unlikely that they will resume work shortly. But there are some 50 or 60 non-Unionists at work, and the question arises as to what is to be done with them, for the two sides cannot be expected to agree, and it would scarcely be fair towards

those who volunteered to work when others would not that they should be peremptorily turned adrift without notice. At Corton Wood the men as yet have not gone in, but the points in dispute have been so narrowed down that an arrangement is likely to be come to.

South Yorkshire coal has gone off tolerably well so far as regards households for the London and other markets, but the state of affairs in the North of England as well as in other places causes coal to be so plentiful as to keep down prices. No change worth speaking of can be expected until there is a marked revival in the iron trade, and with coal so cheap as it now is that turning point should not be far distant. Any advance on the Macdonald principle would very soon lead to iron becoming more depressed than it now is, and the output less. But whilst on one side the cry is for restricting the output, on the other one we have the broad fact staring us in the face that the productive power is rapidly increasing, for almost every week we have to announce the finding of coal at new workings. An immense amount of capital is being sunk in collieries, and it is only natural to suppose that those who venture it look for some little return for the heavy outlay.

REPORT FROM NORTH WALES, SALOP, AND CARDIGAN.

Dec. 19.—The lock-out of the men at Coed Madoc Quarry, Nantlle, happily terminated on the date of my last report. The men tendered an apology, which was accepted, and work was resumed. Negotiations have been in progress for some time past for the resumption of work at the Gorseddau Slate Quarry, near Portmadoc, and it is hoped that they will be successful. This is a quarry at which immense sums of money were spent on outside engineering. The works are all on a massive scale, and the machine house is one of the largest and best built in the Principality. The Prince Llewellyn Slate Company, in Dolyddelen, Carnarvonshire, having offered prizes during the summer to their workmen for the best kept cottages and gardens, awarded on Saturday, the 8th inst., by their agent, Mr. Daniel Williams, the first prize of a silver teapot to Geo. Hughes; and the second prize, of a silver cruet-stand, to Griffith Griffith. Let us hope the workmen will appreciate this endeavour to improve their condition. Your correspondent, "X. X. X.," cannot wish more strongly than I do for the undertaking of well-directed slate quarry operations in Cardiganshire. The strata of the district in question are a continuation of those about Corris, and should be expected to yield slates—slabs they will yield. In the quarries he refers to the cleavage has not been of the best, and "posts" were frequent, but the same remark is also true of portions of one of our largest and best quarries. The trials for slates in the Llangynog district are reported to be progressing satisfactorily.

The speech of the Chairman at the Great Holway Mine meeting is regarded as modest and satisfactory. On two points, perhaps, he will require correction—first, the company will want more engine power and machinery than he supposes; and, secondly, lodes do not increase in productiveness in this district as they approach the coal measures. The future of the Great Holway depends upon the conditions of the lodes in the lower portion of the carboniferous limestone, the horizon of the present workings at the Gorseddau and Merilyn Consols, and of most of the productive mines of Flintshire. A new company has been registered under the title of the Halkyn Lead Mining Company. This is a very general title, inasmuch as the mines on the Halkyn Mountain may be counted by the dozen. I am sorry to record the collapse of one of these—the South Prince Patrick, at which the indications of success have often been promising. Several other mines on the same range of hills are also offered for sale, including the Caerhun, Calcott Hall, and Hazel Grove. In Cardigan there is little change to report. For the most part, however, the reports are less sanguine than they were a short time since. The great discovery of lead ore near Rhayader is not confirmed. The lead mines of Salop are working much as usual.

In the Coal Trade there are but few signs of improvement, although preparations are being made for a revived trade. The West Mostyn Coal Company, who have a large take under the estuary of the Dee, having sunk to and proved the coal seams, which in this part of the field are thick and of good quality, are asking for the capital necessary to complete their works. A fatal accident is reported from the Lilleshall Company, in Shropshire. A man was killed last week by a fall of the roof in one of their pits, in which, assisted by one of their managers, he was in the act of timbering the same. The general depression in the coal and iron trades is felt among others by the excisemen, who complain that they have not nearly as much to do as usual. Their making season began a month later this year, and it is expected to end two months earlier. Happily we have not the distress to complain of that is being endured in South Wales. In connection with the phosphate of lime mine at Pen-y-garnodd, near Llanfyllin, a new industry is springing up. The limestone that underlies the phosphate bed is strongly charged with phosphatic matter. This limestone is being burnt for agricultural use, and from the percentage of phosphate of lime contained in it it is making a valuable manure.

REPORT FROM THE NORTH OF ENGLAND.

Dec. 19.—It is impossible to furnish your readers with any more encouraging facts relative to the iron and allied trades of the North of England. The outlook continues very gloomy, the gloom being intensified by the terrible uncertainty that continues to envelop the Eastern Question. Foreign buyers have almost entirely stayed their hands. Even of pig-iron we are not sending to France and Germany much above one-half of what we shipped at this time last year. The home demand continues fairly active, especially from Scotland and the Midlands, and the shipments coastwise are, therefore, fully equal to the average of former years. But the quantity of iron sold ahead is extremely small, and so long as the war in the East gives cause for so much anxiety it will be idle to look for any solid improvement.

Pig-iron makers in the Middlesbrough district continue to adhere to their prices as declared three weeks ago, and no iron has now been bought from makers who are parties to the combination for less than 41s. per ton No. 3 during the past month. Makers have recently been discussing the propriety of blowing out a number of blast-furnaces, but they have not yet come to a definite conclusion on the subject. They find, in short, that merchants have only a very limited quantity of iron at their disposal, and that the ball is at their feet if they only take care to make a right use of their opportunity. Some makers, however, appear determined to blow-out furnaces rather than risk the accumulation of much heavier stocks than they are already burdened with, and it is probable that in the course of the next few days some furnaces will be extinguished. Buyers are not at all disposed to co-operate with makers in the position the latter have taken up. Some are refusing to purchase altogether. Others let makers alone, and find out merchants who are willing to sell at a few pence per ton less than makers' rates, although it may be that by this course they are forced to take an inferior brand of iron. Some makers who have refused to join in the combination are also selling at a trifle less money than the quotations of the associated masters. But it is manifest that a lot of iron is going into stock, and the chances are that at the end of the current month the retrospect for the year will be far from satisfactory.

Trouble is threatened in the finished iron trade. The employers have given notice of their intention to set aside the existing wages agreement at the end of next March, and between this and that time the board of arbitration will be called to consider whether the present rate of wages shall be maintained. Puddlers are now paid at the rate of 8s. 3d. per ton, which rate has remained unvaried since Messrs. Mundella and Williams reduced wages in the beginning of 1876. During the two years that have since elapsed prices of all kinds of finished iron have largely declined, and it is no secret that there has been a decline even since Mr. Dale's award of August last, which left the *status quo*. Under the circumstances there is a probability that a further reduction of wages will be enforced, although such an event would be all but certain to lead to trouble with the ironworkers, and probably, also, to the breaking up of the board of arbitration, which was threatened only a few months ago. The de-

The geology of the Santa Rita Mines has been very fully treated of by Prof. Raphael Pumpelly, of Harvard University, who remarks that the Santa Rita Mines are from 20 to 25 miles north of the Mexican boundary, and 10 miles east of the Gulf of Tubac. The three nearest shipping ports are Fort Yuma, on the Colorado river, 390 miles distant; Guaymas, on the Gulf of California, 160 miles distant; or Port Lobos, or Libertad, on the Gulf of California, 180 miles distant. They are near that line proposed for the Texas Pacific Railroad, which offers at the fewest engineering difficulties of any possible route across the country. At the base of the granitic ranges there are general outcroppings of gneiss, micaceous talcose, and clay-slates which underlie the quarternary. Towards the Gulf of California these slates are accompanied by massive crystalline limestone, and often appear in independent ridges, which stand against the higher granite hills. These are the sources of the veins of Sonora. Further east there is a great variety of porphyries, both quartziferous and free from quartz; these are the rocks which have the most part stand in the closest connection with the silver and silver galls of the country. The veins of the Santa Rita are very numerous, and have with few exceptions a nearly east and west course. They have in general a nearly vertical dip, and a thickness of from 10 in. to 2 ft., except in a few local instances, where they are enlarged to several feet. The ores consist of galena containing much silica of view are divisible into smelting ores, and ores containing much silica mixed with tetrahedrite; and ores containing much silica and containing a smaller percentage of lead, and which are to be roasted before treatment either by the patent amalgamation, the barrel amalgamation, the salt extraction, or any other of the older, moist processes; and ores containing rich tetrahedrite, native silver, sulphur of silver, and other simpler or complex salts of this metal, and needing neither roasting nor magistral for their amalgamation by the patio process. It is

his opinion that the Santa Rita veins are deserving of thorough examination, and without the making of sums necessary to carry it out, and that, if properly executed, it would lead to the establishment of a highly profitable mining industry.

THE YORKSHIRE COLLEGE, LEEDS.

By the liberality of the Worshipful the DRAPERS' COMPANY, the COUNCIL are prepared to APPOINT an INSTRUCTOR IN COAL MINING, At the stipend of £100 per annum and half the Students' Fees. A portion only of the Instructor's time will be required. The fuller conditions and duties of the office may be learned from the Secretary. Applications and testimonials must be received on or before January 18, 1878. W. F. HUSBAND, Secretary. Dec. 19, 1877.

TO MINING COMPANIES.

WANTED.—A MINE MANAGER, of large Foreign and Colonial experience in Gold, Silver, Iron, &c., and Phosphates, desires a SITUATION as MANAGER, or to INSPECT FOREIGN MINING or REDUCED TROY PROPERTIES. He is thoroughly up in the reduction of the Base Metal Ores of the Pacific Slope, and the erection of the necessary plant. For testimonials and reference, address, in first instance, to "Cosmo," MINING JOURNAL Office, 26, Fleet-street, London, E.C.

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WANTED TO PURCHASE. ONE HUNDRED SHARES in GROGWINION LEAD MINE (LIMITED), for prompt CASH. State lowest price to "Investor," MINING JOURNAL Office, 26, Fleet-street, London, E.C.

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Notice is hereby given, that the ORDINARY GENERAL MEETING of the above company will be HELD at the offices of the company, No. 1, Winchester House, Old Broad-street, London, E.C., on FRIDAY, the 28th day of December, 1877, at Two o'clock.

The Transfer-books will be closed from the 1st to the 18th proximo. By order, SYDNEY A. COBBETT, Secretary. 1, Winchester House, Old Broad street, London, E.C., 4th December, 1877.

THE MALPASO GOLD WASHING COMPANY (LIMITED).

Notice is hereby given, that the ORDINARY GENERAL MEETING of the above company will be HELD at the offices of the company, No. 1, Winchester House, Old Broad-street, London, E.C., on FRIDAY, the 28th day of December, 1877, at One o'clock.

The Transfer-books will be closed from the 1st to 18th proximo inclusive. By order, SYDNEY A. COBBETT, Secretary. 1, Winchester House, Old Broad-street, London, E.C., 4th December, 1877.

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SUBSCRIBED CAPITAL ... £2,000,000
PAID UP ... 600,000
RESERVE FUND ... 80,000

The Court of Directors of the Colonial Bank hereby give Notice that, in pursuance of the provisions of the Charter, a HALF-YEARLY GENERAL MEETING of proprietors will be HELD at the Bank House, 13, Bishopsgate-street Within, E.C., on THURSDAY, the 3rd January, 1878, at Two o'clock precisely, to receive the report of the proceedings of the Corporation, and for the election of directors and one auditor in the room of the following gentlemen, who go out by rotation, viz.:—Charles Cave, Esq., Harry Hankey Dobree, Esq., Eden Colrie, Esq., William Davidson, Esq., and James Fletcher, Esq., as directors; and Charles L. Prescott, Esq., as auditor, all of whom, being eligible, offer themselves for re-election.

The Transfer-books of the Corporation will be closed on the 19th December, 1877, and reopened on the 7th January, 1878.

By order of the Court of Directors, JAMES CLARK, Secretary. 13, Bishopsgate-street Within, E.C., 8th December, 1877.

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TESTIMONIAL TO A MINE CAPTAIN.—At the conclusion of the ordinary business of the Wheat Pease meeting, the Chairman (Mr. T. Pryor) in an appropriate address to the suggestion that had been made by certain influential London shareholders that the exertions of their agents should receive some substantial recognition. The suggestion met with his (the Chairman's) approval, and he had much pleasure in proposing that a present of 20 guineas be made to Capt. W. H. as an acknowledgment for his able management of the mine. The vote was unanimously agreed to.

In the Court of the Vice-Warden of the Stannaries. Stannaries of Cornwall.

IN the MATTER of the COMPANIES ACTS, 1862 and 1867, and of the CHARLOTTE UNITED MINES (LIMITED).—TENDERS will be RECEIVED by the Official Liquidator of the said company, addressed to him at the Stannaries Court Office, in Truro, until the 5th day of January next, stating the HIGHEST PRICE which will be given for all the INTEREST of the company in the SETT or SETTS under which its mining operations have been carried on at Charlotte United Mines, in the parish of St. Agnes, within the said Stannaries, and also the WHOLE of the PLANT, MACHINERY, MATERIALS, and EFFECTS belonging to the said company at and upon the said mine. To inspect the above, apply to the Bailiff in charge at the mine, and for further particulars to Mr. JOHN HENRY HANLEY, the said Official Liquidator.

HODGE, HOCKIN, AND MARRACK, Truro. (Solicitors for the Official Liquidator.) Dated Stannaries Court Office, Truro, 19th December, 1877.

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MINING AND CIVIL ENGINEER, AT BERNALILLO, NEW MEXICO, U.S. OF AMERICA. Has 24 years' experience in Mining and Smelting, and 10 years' experience in American Business and Law, offers his services at moderate charges for Reporting on Mining and other Property in any of the above-named States or Territories; gives correct, safe, and responsible advice as to securing full titles and possession; and, as to best mode of utilizing the property, will assist in settling existing difficulties by compromise, and in disposing of developed mining property when held at real value; offers his assistance for securing undeveloped mining properties at home prices. As to care taken in reporting, reference is made to the Mining Journal Supplement, April 1, 1876, containing report on property of the Maxwell Land Grant and Railway Company; as to technical standing, to the prominent men of the trade—compare Mining Journal of Aug. 30 and Nov. 31, 1872, and New York Engineer and Mining Journal, Feb. 28, 1874.

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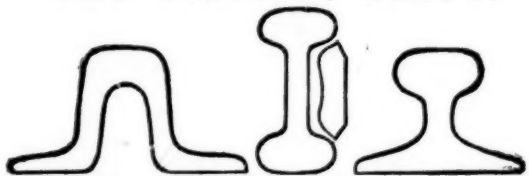
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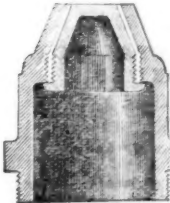
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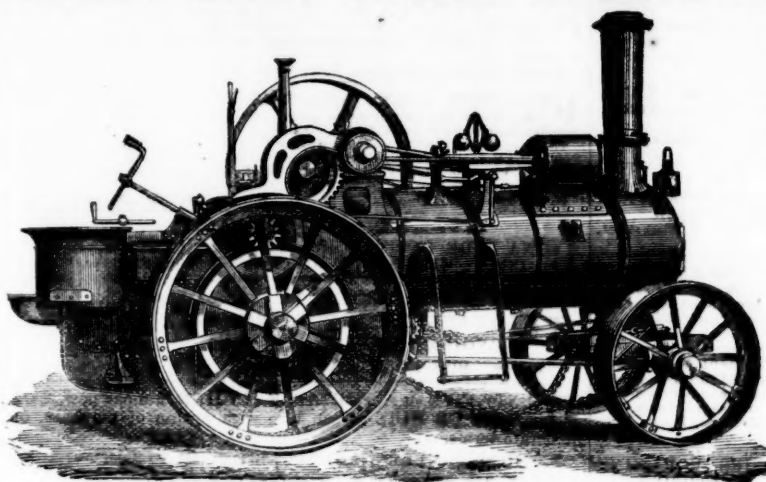
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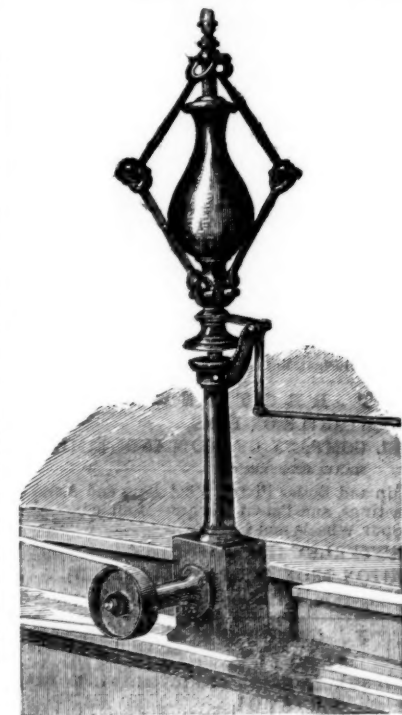
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